

**BRITISH RAINFALL,
1889.**

LONDON :

G. SHIELD, PRINTER, SLOANE SQUARE, CHELSEA, S.W.

1890.

DIFFERENCE OF TOTAL RAINFALL IN 1889 FROM THE AVERAGE OF 1870-79.



The round dot indicates a rainfall within 10 per cent. of the average.

The + and — respectively show excess or defect of between 10 and 25 per cent.

The same signs enclosed by a ring indicate a departure from the average of more than 25 per cent.

BRITISH RAINFALL, 1889.

ON

THE DISTRIBUTION OF RAIN

OVER THE

BRITISH ISLES,

DURING THE YEAR

1889,

AS OBSERVED AT NEARLY 3000 STATIONS IN
GREAT BRITAIN AND IRELAND,

WITH ARTICLES UPON VARIOUS BRANCHES OF RAINFALL WORK.

COMPILED BY

G. J. SYMONS, F.R.S.,

*Secretary Royal Meteorological Society; Membre du Conseil Société Météorologique de France;
Member Scottish Meteorological Society; Korrespondirende Mitglied Deutsche
Meteorologische Gesellschaft; Member of Council Royal Botanic Society;
Registrar and Member of Council Sanitary Institute; Fellow Royal
Colonial Institute; Membre correspondant étranger Soc. Royale de
Médecine Publique de Belgique; Hon. Mem. Hertfordshire Nat.
Hist. Soc., Essex Field Club; Northamptonshire Nat. Hist.
Soc., Croydon Microscopic Soc., &c. &c. &c.*

LONDON:

EDWARD STANFORD, COCKSPUR STREET, S.W.

1890.

CONTENTS.

PREFACE	PAGE 7
REPORT—THE NEW DECADE—NORTH WALES GAUGES—THE NUNES GAUGES—THE ROYAL SOCIETY LAKE DISTRICT GAUGES—MANCHES- TER, SHEFFIELD, AND LINCOLNSHIRE RAILWAY COMPANY—INSPECTION OF RAINFALL STATIONS—OVERFLOWING OF RAIN GAUGES—OLD OBSERVATIONS—FINANCE	8
ON THE AMOUNT OF EVAPORATION	18
THE CAMDEN SQUARE EVAPORATION EXPERIMENTS	43
ROTHERHAM EXPERIMENTAL GAUGES	44
RAINFALL AT THE ROYAL OBSERVATORY, GREENWICH	46
THE STAFF OF OBSERVERS... ..	47
OBITUARY	61

RAINFALL AND METEOROLOGY OF 1889.

ON THE METEOROLOGY OF 1889, WITH NOTES ON SOME OF THE PRINCIPAL PHENOMENA	[3]
OBSERVERS' NOTES ON THE MONTHS OF 1889	[26]
OBSERVERS' NOTES ON THE YEAR 1889	[55]
HEAVY RAINS IN SHORT PERIODS IN 1889... ..	[69]
HEAVY FALLS IN 24 HOURS DURING 1889... ..	[72]
DROUGHTS IN 1889	[82]
MONTHLY RAINFALL OF 1889	[87]
TABLES OF MONTHLY RAINFALL AT 233 STATIONS IN 1889	[88]
RELATION OF THE TOTAL RAINFALL IN 1889 TO THE AVERAGE	[98]
COMPARISON OF THE RAINFALL OF THE YEAR 1889 WITH THE AVERAGE 1870-79... ..	[100]
EXTREMES OF RAINFALL IN 1889	[104]

GENERAL TABLES OF TOTAL RAINFALL.

EXPLANATION OF THE ARRANGEMENT OF GENERAL TABLES	[106]
COUNTY INDEX TO GENERAL TABLES	[107]

ILLUSTRATIONS.

MAP of ANNUAL RAINFALL IN 1889	<i>Frontispiece</i>
PERCOLATOR	<i>p. 19</i>
EVAPORATORS	<i>p. 22, face p. 28, face p. 30, p. 40</i>
DIAGRAM ILLUSTRATIVE OF HEAVY RAINS IN SHORT PERIODS... ..	<i>p. [69]</i>
MAPS OF MONTHLY RAINFALL IN 1889	<i>between pp. [94]—[95]</i>

ERRATA IN BRITISH RAINFALL, 1888.

- Page [22]. The entry for October 12th should be moved to November 12^t h.
,, [45]. Babbacombe, line 10, for twice read thrice.
,, [46]. Line 10, for 1888 read 1887.
,, [81]. Last line of Derringham, [for 9,206 read 920·6, and for 10,724 read
1072·4.
,, [93]. Line 13, for 0·13 read 0·33.
,, [95]. Last column, second line, for 1·08 read 1·80.
,, [125]. Abbey Leix (Blandsfort), for 32·94 read 33·94.
,, [164]. Worksop (Osberton), gauge badly mounted ; record too large.
,, [182]. Scilly (St. Mary's), for 29·28 read 29·34.

BRITISH RAINFALL, 1889.

WITH the present volume ends the third consecutive decade of rainfall returns with which I have been favoured, and which it has been my privilege to publish.

I am glad to say that of the 168 meteorologists who thirty years ago contributed observations to the leaflet which, under the title "English Rainfall, 1860," started this series of volumes, sixteen have reported in every subsequent year, and their returns for 1889 are to be found in the following pages.

As this is the closing volume of the decade, I do not like it to go forth without mentioning what I always feel most deeply—viz., my thankfulness to the thousands of correspondents who have enabled me to make our Rainfall organization what it is. I am obliged to be dictatorial; otherwise we should drift away from uniformity, precision, and accuracy. I know no parallel to the case of the voluntary submission which has characterized our work, and I think that it shows remarkable devotion and personal self-denial on the part of the observers, that during the thirty years in which I have had the honour of carrying on this work, not more than a dozen out of the (probably) 9,000 or 10,000 observers who have helped me, have taken offence at my criticisms on their returns, and have withdrawn in consequence. If that is not evidence of British good temper, and of submission to rules designed to secure efficiency and accuracy, I do not know what would be accepted as such.

G. J. SYMONS.

62, CAMDEN SQUARE, N.W.

July 4th, 1890.

REPORT.

The New Decade.—When I began my last report by sketching out what ought to be done to ensure that all should be in good order on January 1st, 1890, I did not realize how hard a nine months' work I was preparing for myself. Fortunately for rainfall, my two assistants and I escaped the prevalent illness of last winter, and so finally, but after a very heavy strain, we have cleared off all the extra work, and done all that our limited resources permitted towards commencing a large series of good observations for the decade 1890-99.

The first thing to which we had to direct our attention was the perfecting, absolutely to date, of the list of observers. Without a little thought, persons would imagine that to be very easy, in fact, that all effort were superfluous, as evidently the list should be always perfect. Yes, but with a staff of nearly 3,000 persons, deaths and removals are frequent, and new names have to be entered, and at times such entries have to wait while more pressing work is done. There was not much to do, but it was the first step. Then a circular was prepared, and 3,000 copies of it were printed, and folded, and about 2,800 copies addressed—one to every observer on the register. These circulars called the attention of the observers to points in which long experience had taught me that they were most likely to need a reminder; such as the metal of the gauge having begun to rust, trees or shrubs already sheltering it, or being likely to do so, the gauge being insufficiently large, *e.g.*, not holding more than two or three inches, so that in a great storm the record would be lost. Observers were also asked whether they had a copy of *Arrangements* (see reprint at the end of this volume), and whether their observations were in all respects made in accordance with the rules therein. Lastly, they were invited to mention the names of any persons already making good observations, or likely to be willing to do so. It is much easier to mention the issue of such a number of circulars, than it is to see that they are all properly addressed and started, but that was nothing compared to dealing with them when they came back at the rate of two or three hundred a day. However, I am very glad that I issued them, and that the observers were kind enough to return a very large proportion of them carefully filled up. They went out in October, and the replies and

correspondence arising therefrom (far over 1,000 separate letters) took till the middle of December; in fact, not a few came in later still, but they were then merged in the ordinary correspondence and unimportant. I have now to summarize the result. I think that it did an immense amount of good. Many trees have been lopped or removed altogether, more than a hundred new gauges have been started by old observers as checks on their present ones, and to ensure the continuity of their records when the old gauges have to be abandoned, or to provide themselves with gauges, which if the inner vessel overflows will still hold the heaviest rain. A special circular on this subject will be found further on.

Another very valuable result, and one which has at the same time both pleased and slightly vexed me, has been the large number of persons who have long been keeping records, but of whom I had not previously been informed. I am very pleased to welcome them to our body, but I am rather vexed not to have heard of them before. For twenty years or more every one of the little perforated forms (of which I must have issued 50,000) has borne the following request "If you know of any records not quoted in *British Rainfall*, please mention the stations and the observers' names." Not a year passes that I do not receive some responses to this request, but as a rule it is overlooked, and this is proved by the special circular having brought scores of new names. I shall be very glad if my correspondents will bear this in mind in the future. Every observer has a personal interest in helping me to make our joint work as nearly perfect as possible, and I rely upon them to prove it. Anyone who sees a record in a newspaper from a station which he does not recognise as from one of our body, will greatly oblige by distinctly marking it, and sending the paper to Camden Square.

After these circulars had been cleared off, I wrote a letter, which was kindly inserted in *The Times*, in which I further invited all who were making good observations but had not previously communicated them to me to do so, and I also intimated my willingness to help any who desired to co-operate. This led to a still further augmentation.

Another point had meanwhile arisen. There were two small classes of cases in which gauges had to be provided—some eventually to replace gauges nearly worn out, some to provide gauges in important localities where the observers could not afford to do so. This difficulty was entirely removed by the liberality of Mr. James Sidebottom, of Hadfield, Manchester, who paid for all such gauges

as were required. In the map illustrating our recent gains all these stations are marked with square dots instead of round ones.

I had intended to give here a list of the acquisitions, but it is very long, considerably over 100, and, as many of them will claim entry in the usual article on "The Staff of Observers," it seems better to put all there, than to divide or repeat it.

North Wales Gauges.—I am very glad that I inserted last year a short paragraph respecting Major Mathew's good work in North Wales, for since then our kind helper has been taken from us. He had been doing more for rainfall work than I knew. He used to send records from many places, and I knew that he provided the gauges, and paid small sums for printing and for postage, but I did not know that he had for years been paying several of the observers for making the observations. I found it out only when Christmas came round, and they applied to me, instead of to him. I could not afford to keep all, so dropped the least important, and have kept on the others.

The Nunes Gauges.—Out of the £100 left for rainfall work by Miss Nunes in 1883, I purchased and distributed to districts where observations were urgently needed 34 rain gauges. On the whole, the observers selected have proved very efficient, and there have been few either of removals or interruptions or deaths, but there are seven gauges not returned or accounted for, their history being as follows:—

County.	Station.	Observer.	Result.
Kent.....	Maidstone (Bicknor) ...	Rev. W. G. Waterman...	Reported regularly to end of 1887; has not replied to any subsequent letter.
Cheshire	Tarporley(OultonPark)..	Mr. H. Ward	1883 and 1884 sent; no subsequent reply; believe that observer died.
Glamorgan ...	Cymmer	Dr. Davies	No return ever received.
Inverness.....	Armada Castle	Mr. Bruce	No reply since 1887.
Shetland	Lerwick	J. M. Goudie, Esq.	No reply since 1886.
,,	Foula Island	Mr. G. Morrison.....	No return ever received.
Antrim.....	Belfast (Glen Bank).....	L. M. Ewart, Esq.....	No return since 1886.

We have now out of the 34 gauges 25 still at work, and of the 25, 15 are absolutely perfect records from 1883 to the present time.

The Royal Society Lake District Gauges.—These 24 gauges were purchased out of a grant of £42 7s., made by the Royal Society in 1886. The gauges were necessarily of exceptional size, and there was outlay for carriage, fixing, &c., so that they cost on the average £1 15s. each, delivered and fixed. On the whole they have yielded very good results. The absentees or lost gauges are the following :—

County.	Station.	Observer.	Result.
Cumberland	Watendlath	Mr. B. Cannon	Observer dead
„	The Styne (Gauge A)	Mr. Wilson	Burst by frost
„	Cross Fell	T. G. Benn, Esq.	Gauge smashed on Jubilee night
Westmoreland ..	Kentmere	Rev. R. Jackson Pigott ..	No reply to letters
„	Mardale	J. C. Boustead, Esq.	No reply to letters

The result, therefore, is that out of the 24 gauges 19 are still at work, and as was pointed out in *British Rainfall*, 1887, many of them are in districts such as Skiddaw Forest, Saddleback, and the vicinity of Cross Fell, concerning the rainfall of which we were previously entirely ignorant.

Manchester, Sheffield, and Lincolnshire Railway Company.—Two steps further forward have been taken towards the efficiency of the rain gauge system of this Company—(1) All their gauges have been visited by the superintendent, Mr. Taylor; and (2) several new gauges have been erected in the western part of their district.

Inspection of Rainfall Stations.—Although we are still without the permanent inspector, who is so much needed, but who cannot be afforded, I have been able to visit some score or more stations, and the position returns already alluded to have been very useful in bringing to light points in which the observations at some stations were capable of improvement.

Overflowing of Rain Gauges.—The position papers revealed the fact that many gauges were still in use which would fail if three inches of R fell. I therefore prepared the following circular, and sent a copy to every one whose gauge appeared to be liable to fail in an exceptional R :—

RAIN GAUGES OVERFLOWING.

WHEN one has been observing the rainfall for 10 or 20 years, and has never measured more in 24 hours than two inches, it is very difficult to bring oneself to believe in the necessity for Rule XVI. :

XVI.—OVERFLOW.—Not a year passes in which some observers do not allow their gauges to overflow, it is therefore necessary to call attention to the fact that there does not seem to be any part of the British Isles where 4 inches may not fall in 24 hours. It is not desirable to purchase any gauge of which the capacity is less than 6 inches.

But receiving as I do thousands of returns from all parts, I know that it is necessary. I know also how astonished, and how vexed, observers are, when they find that, through disbelieving and disobeying the rule, they have lost an exceptional record of great importance both to meteorology and to engineering, and have spoiled a record which had been carried on perfectly for many years.

The following list deals with only five years, and yet it shows that these heavy falls of 3, 4, or 5 inches may occur in *all parts of the country*.

Heavy Rains in 24 Hours—1884–88.

- KENT—3·50 July 31, 1888.
 SUSSEX—3·20 to 3·65 Dec. 26, 1886, and 3·25 to 3·40 July 31, 1888.
 HAMPSHIRE—3·16 to 3·46 December 26, 1886.
 HERTS—3·24 June 26, 1888.
 BUCKS—3·08 July 25, 1886.
 NORTHAMPTON—3·18 July 25, 1886.
 ESSEX—3·20 to more than 4·56 August 1, 1888.
 NORFOLK—3·09 July 30, 1888.
 DORSET—3·72 November 12, 1888, and 4·20 December 26, 1886.
 CORNWALL—3·10 to 3·13 September 10, 1885.
 SOMERSET—3·00 to 3·21 September 10, 1885.
 HEREFORD—3·50 May 13, 1886.
 SHROPSHIRE—3·25 to 3·59 May 13, 1886.
 LANCASHIRE—3·20 July 2, 1888, and more than 3·40 July 25, 1886.
 YORKSHIRE—3·20 to 4·10 July 25, 1886, and 4·50 to 4·57 July 2, 1888.
 DURHAM—3·20 November 5, 1886.
 CUMBERLAND—4·00 to 5·20 October 27, 1888, and 6·78 March 8, 1884.
 WESTMORELAND—3·63 to 4·45 October 27, 1888.
 WALES (South)—3·15 to 3·49 Jan. 28, 1885 ; 3·65 March 26, 1886, and 3·59 October 15, 1886.
 „ (Central)—3·83 October 15, 1886, and 4·30 November 27, 1885.
 „ (North)—3·74 July 2, 1888.
 SCOTLAND (S. W.)—3·20 to 3·50 various dates.
 „ (Central)—3·51 November 8, 1884.
 „ (N. E.)—3·11 November 27, 1885, and 3·44 August 12, 1885.
 „ (N. W.)—3·69 to 5·21 various dates.
 IRELAND (W.)—4·93 September 1, 1887.
 „ (E.)—3·30 to 3·38 October 15, 1886.

I shall be very glad if, on the first fine day after receiving this note, each observer will measure into a can five inches of rain, *i.e.*, of course water equal to 5 inches by his gauge, and will pour the whole into the gauge, and see that the gauge holds it all, so that, had it been real rain he would have been able to measure it. If this is not the case, I hope that he (or she) will obtain an additional new gauge of adequate capacity.

G. J. SYMONS.

Proof that much remains to be done was afforded by the Hertfordshire storm of July 12th, 1889, when the following gauges ran over, spoiling records lasting in some cases for twenty years. Hemel Hempstead, Apsley Mills, Panshanger, Welwyn Rectory, Cowroast; and the following cutting, given me quite recently by Mr. Cuthbert Peek, tells a similar tale:—

LYME REGIS.

THE GREAT STORM.—The storm of Whit-Sunday, 1890, is one to be remembered for many reasons, but mostly for the destructive effects of the flood, caused by the enormous quantity of rain that fell. So great was the fall that several rain gauges overflowed, and the exact quantity in those instances could not be ascertained; but at Holme Cleve, the residence of Mr. T. E. D. Philpot, nearly four inches (3·70) were registered. This is considerably more than an average month's rainfall.

Old Observations.—Not five minutes work has been done during the year towards the reduction of the 17th and 18th century observations, and I and my helpers are still so overworked that I can form no definite idea as to when the subject can be dealt with—certainly not for some months to come.

Finance.—This department shows no progress. I do not like to think that this arises from unwillingness to help, and therefore try to believe that it is due to observers erroneously considering that the cost of the organization is defrayed either by the director being a rich man (one delusion), or by some powerful society (another delusion), or by the Government (also a delusion). It is met by the subscriptions enumerated in the following list, which contains the names of *not* one observer out of each seven who send returns. If I had more funds, I could do better work and get more help, and so make more rapid progress, which would benefit everybody; but if not, I must go on as at present, until I can go on no longer

LIST OF ALL SUMS OF £1 AND UPWARDS RECEIVED IN PAYMENT
FOR BOOKS, DIAGRAMS, &c., OR AS CONTRIBUTIONS TO THE
GENERAL EXPENSES OF RAINFALL INVESTIGATIONS IN 1890.

CORPORATIONS AND WATER COMPANIES.

Accrington Gas and Water Co.	1	1	0
Aire and Calder Navigation Co.	1	6	0
Brighton Corporation.....	1	10	0
Bristol ,, ...	1	1	0
Bury ,, ...	1	0	0
Cambridge Water Works Co.	1	1	0
Doncaster Corporation	1	1	0
Leeds ,, ...	1	16	0
Middlesborough 	1	1	0
Newcastle Water Works Co.	1	1	0
Nottingham Corporation	1	1	0
Weaver Navigation Co.	1	6	0

	£	s.	d.		£	s.	d.
Abbotts, R. W., Esq.	3	15	0	Benyon, R., Esq.	5	0	0
Abercromby, Hon. Ralph	1	0	0	Berners, C. H., Esq.	1	1	0
Adams, Prof. J. C., F.R.S. (2 yrs.)	2	0	0	Berridge, W., Esq.	1	2	0
Addington, Rt. Hon. Lord	1	1	0	Best, Colonel.....	1	5	0
Adie, Mrs.	1	0	0	Bickham, Spencer H., Esq. ...	1	7	0
Ainsworth, Col.	1	1	0	Bicknell, P., Esq.	3	0	0
Aldam, W., Esq.	1	0	0	Biddell, G. A., Esq., C.E.	1	5	0
Ames, E. L., Esq.	2	10	0	Birkbeck, W., Esq.	1	0	0
,, F., Esq.	1	0	0	Black, W. C., Esq., of Kailzie	1	0	0
,, H. St. V., Esq.	1	1	0	Blackburn, Prof.	1	0	0
Andersson, W. H. jun. Esq. (2 yrs.)	2	0	0	Blackmore, R. D., Esq.	1	1	0
Appach, Miss.	1	1	0	Blake, A. M., Esq.	1	0	0
Arkwright, J. H., Esq.	1	10	0	,, W., Esq.	2	5	0
Armstrong, Rt. Hon. Lord, FRS	1	10	0	Blamire, Rev. W. H.	1	5	0
Ashwell, H., Esq.	1	0	0	Blathwayte, Col.	1	12	6
Assheton, R., Esq.	1	5	0	Blomefield, Rev. L.	1	10	0
Backhouse, J. E., Esq.	2	0	0	Boscawen, Capt. Griffith.	1	2	0
,, T. W., Esq.	4	15	0	Boughton, Miss F. H. R.	1	1	0
Baines, L. T., Esq.	1	1	0	Bowles, Rev. F. A.	1	5	0
Baker, Miss F.	1	1	0	Boyd, The Ven. Archdeacon ...	1	7	6
,, W. C., Esq.	1	0	0	Bradford, Rt. Hon. Earl of.	1	0	0
Balfour, D., Esq., C.E.	1	0	0	Bradshaw, Admiral.	2	10	0
Ballingal, J. S. R., Esq.	1	11	0	Bramwell, Sir F. J., Bt., F.R.S.	2	2	0
Balme, E. B. W., Esq.	2	12	0	Branfill, Gen.	1	1	0
Barnes, R. H., Esq.	1	1	0	Bridgeman, Hon. & Rev. J. R. O.	1	1	0
Barne, Col. St. J.	1	0	0	Bridport, Rt. Hon. Viscount ...	3	0	0
Barrington, R. M., Esq.	1	0	0	Brook, C. L., Esq.	2	2	0
Battersby, Worsley, Esq.	1	1	0	Brooke, Miss E.	3	14	0
Baxendell, J., Esq.	1	1	0	,, Col.	1	5	0
Bayard, F. C., Esq.	2	4	0	Brooks, Sir W. Cunliffe, Bt., M.P.	1	1	0
Beauchamp, E. B., Esq.	1	0	0	Brown, Rev. D.	1	0	0
Beck, Major Alcock.	2	0	0	,, F. F., Esq.	1	1	0
Bell, Major.	2	2	0	,, Miss	1	0	0
Bentley, G., Esq.	1	1	0	Brunner, Mond & Co., Messrs.	2	2	0

	£	s.	d.		£	s.	d.
Buchanan, Col.....	1	0	0	Fisher, W. Esq.	1	0	0
„ G., Esq., C.E.	1	1	0	Fitzgerald, Prof. G. F., F.R.S.	1	0	0
Burder, G. F., Esq., M.D.....	1	5	0	Fleming, T. R., Esq.	1	0	0
Burman, Dr.	1	0	0	Forde, Colonel	2	5	0
Bushell, R., Esq.	2	0	0	Forsyth, J. N., Esq.....	1	0	0
Butler, W. B., Esq.	1	1	0	Foster, R., Esq.....	2	0	0
Cameron, A., Esq.	1	0	0	„ R. J., Esq.	1	1	0
Campbell, C. D. H., Esq.	1	0	0	Fowler, Sir J., Bt.	1	1	0
Carmichael, P., Esq.	1	5	6	Fox, Rev. W. H.	2	0	0
Carr, Rev. E. D.	1	0	0	Furlong, R. O'B., Esq.	1	0	0
Chambers, B. E. C., Esq.	1	2	0	Gabb, W. B., Esq.	1	1	0
Chancellor, F., Esq.....	1	1	0	Gale, J. M., Esq., C.E.....	1	1	0
Chapman, E., Esq.	3	5	0	Gamlan, Miss	1	10	0
Chrimes, R., Esq.	10	0	0	Garnett, W., Esq.....	5	0	0
Christopherson, Rev. A.	1	0	0	Goode, W., Esq.	1	1	0
Church, H. P., Esq.	1	1	0	Graham, Dr.	2	0	0
Clutterbuck, Rev. F. C.	1	0	0	Green, Lawrence, Esq.	1	0	0
Cody, Rev. E. G. (2 years) ..	2	0	0	Greg, A., Esq.	1	0	0
Collingwood, E. J., Esq.....	1	0	0	Grey, Right Hon. Earl, K.G...	1	0	0
Coode, E., Esq.....	1	3	0	Grundy, R. A., Esq.	1	0	0
„ W., Esq.	1	7	3	Gulson, J., Esq.	1	12	0
Coppin, J., Esq., ...	1	0	0	Hadden, Miss E. B.	1	0	0
Corrie, A. J., Esq.	1	6	0	Hall, Arthur H., Esq.	1	1	0
Courtauld, S., Esq....	1	1	0	„ Col.	1	0	0
Courtown, Rt. Hon. Earl of ...	1	0	0	Halliday, W., Esq.	1	0	0
Cowper, The Rt. Hon. Earl ...	1	1	0	Hambly, C. H. B., Esq.....	1	1	0
Croft, Miss Joyce	1	0	0	Hamlyn, J., Esq.	1	1	0
Crowley, F., Esq.	1	10	0	Hankinson, R. C., Esq.	1	1	0
„ P., Esq.	1	17	0	Harcourt, E. W., Esq.....	1	0	0
Cruikshank, Dr.	1	0	0	Harris, C. E., Esq.	1	11	0
Daniell, G. H., Esq.....	1	1	0	„ W. J., Esq.	2	5	0
Darsie, J. R., Esq.	1	1	0	Harwood, A., Esq.	1	1	0
Dawson, A. Mitchell, Esq.....	1	0	0	Hatherley, N. C., Esq., M.D...	1	0	6
Dees, R. R., Esq.....	1	5	0	Hayhurst, Colonel.....	1	1	0
De Laune, C. de L. F., Esq. ...	2	12	0	Hayle, T. H., Esq.	1	1	0
Denison, Col.....	1	1	0	Haywood, T. B., Esq.....	1	1	0
Denny Bros., Messrs.	4	4	0	„ Col.	1	1	0
De Rance, C. E. Esq.	1	10	0	Heberden, Rev. W.	1	0	0
Devas, Mrs.	1	0	0	Hedgeland, Rev. Preb.....	1	1	0
Devonshire, H. G. the Duke of	2	0	0	Helps, A. S., Esq.	1	0	0
Dines, W. H., Esq.....	1	0	0	Hesketh, R. L., Esq.	1	1	0
Dixon, G., Esq.....	1	5	0	Higgins, the late H., Esq.....	1	0	0
Doncaster, D., Esq.	1	1	0	Hill, Rev. Canon	2	0	0
Dudgeon, P., Esq.....	1	1	0	„ A., Esq.	1	1	0
Duncan, J., Esq.	1	1	0	„ J. H., Esq.	1	10	0
Du Port, Rev. Canon	1	0	0	Hodgson, Rev. F.G.	1	1	0
Dymond, Miss E. A.	1	16	0	Holdsworth, J. S., Esq.	1	0	0
„ E. E., Esq.	5	0	0	Holland, Rev. C.	1	1	0
Eaton, H. S., Esq.	1	0	0	Holmes, W. H., Esq.	1	0	0
Edge, T. L. K., Esq.	1	0	0	Hooper, R. N., Esq.	1	0	0
Ellice, Mrs.	1	1	0	Hope, Mr. B.	1	0	0
Ellis, The Hon. and Rev. W. C.	2	0	0	Hopkins, W. R. Innes, Esq. ...	1	1	0
Erskine, Sir T., Bart.	2	0	0	Horner, Mrs.	1	0	0
Esdaile, C. J., Esq.	1	1	0	Horsfall, T. C., Esq.	1	0	0
Evans, F. G., Esq.	1	10	0	Horsley, J. J., Esq.....	1	5	0
Eyre, Rev. W. L. W.	1	11	0	Hoskins, Miss	1	0	0
„ F. H. D., Esq. ...	2	0	0	Howard, W. D., Esq.	10	15	0
Farrer, Sir T. H., Bt.	2	2	0	Howes, Rev. J. G.	1	5	0
Fellows, G., Esq.....	1	1	0	Hurnard, S. F., Esq.	1	1	0
Fenwick, T., Esq., C.E.....	1	10	0	Hurst, T. G., Esq.	1	1	0
Field, Rogers, Esq., C.E.	3	14	0	Hutchings, Rev. R. S.....	1	7	0
Filgate, T. F., Esq.	1	0	0	Hutchinson, A., Esq.	2	5	0

	£	s.	d.
I'Anson, Dr.	1	1	0
Ingram, Colonel	1	0	0
Jackson, M., Esq.	1	1	0
" Mrs. R.	1	1	0
Jenkin, S. W., Esq., C.E.	1	0	0
Johnstone, J. C., Esq., M.D....	1	3	6
Jordan, F. W., Esq.	1	1	0
Kay, Sir Brooke, Bart.	1	5	0
" D. J., Esq.	2	0	0
Kettlewell, W. W., Esq.	1	0	0
King, S., Esq.	1	0	0
Kitchin, Mrs.	1	1	0
Knowles, G., Esq.	1	1	0
Langton, Miss	1	0	0
Latham, Baldwin, Esq., C.E....	2	2	0
Laurie, Rev. Sir E., Bt.	1	1	0
Lawrence, D., Esq.	1	0	0
Lawson, Sir Wilfrid, Bt., M.P.	1	1	0
Lea, A. A., Esq.	1	1	0
Lee, E. A., Esq.	1	1	0
Ley, Rev. W. C. (4 years).....	4	0	0
Littleboy, R., Esq.	1	0	0
Livesey, D. T., Esq.	1	0	0
Llewellyn, Sir J. T. D., Bt. ...	1	1	0
Lloyd, R. Lewis, Esq.	2	0	0
Lovelace, the Rt. Hon. Earl of	2	0	0
Low, W., Esq.	1	0	0
Lucas, W., Esq.	2	2	0
Macaulay, J., Esq.	1	5	0
Mace, J. Ellis, Esq.	1	1	0
Macfie, R., Esq.	5	0	0
Mackeson, H. B., Esq.	1	5	0
Maddy, T. H., Esq.	1	3	6
Major, R. H., Esq.	1	0	0
Mann, E., Esq.	1	4	0
Mansergh, J., Esq., C.E.	2	2	0
Markham, C. A., Esq.	2	0	0
Marks, T. T., Esq.	1	1	0
Marling, W. J. Paley, Esq. ...	1	1	0
Marshall, Arthur, Esq.	10	0	0
" John, Esq.	2	0	0
" Stephen, Esq.	2	0	0
Marson, J., Esq.	2	2	0
Marten, E. B., Esq., C.E.	1	12	0
" H. J. Esq., C.E.	1	1	0
Maw, C. T., Esq.	1	1	0
Mawley, E., Esq.	1	2	0
Maxwell, Rev. E.	1	1	0
" Major Somerset	2	5	0
Meares, J. L. D., Esq.	1	0	0
Mellish, H., Esq.	2	10	0
Melville, A. H. Leslie, Esq. ...	1	0	0
" A. S. Leslie, Esq. ...	1	0	0
Mercer, R. M., Esq.	1	1	0
Merrifield, J., Esq.	1	1	0
Metcalf, Miss B.	1	1	0
Milnes, E., Esq.	1	0	0
Mitchell, Col.	1	1	0
" F. J., Esq.	1	0	0
Moore, Dr. J. W.	1	0	0
Morrison, W., Esq., M.P.	2	0	0
Mossman, R. C., Esq.	1	1	0

	£	s.	d.
Mostyn, C., Esq.	1	1	0
Mount, Rev. C. B.	1	0	0
Muirhead, H., Esq., M.D.	1	1	0
Myers, W. H., Esq.	1	1	0
Nash, Mr. W. R.	1	5	6
Neame, E., Esq.	1	0	0
Neumann, H., Esq.	1	0	0
Newman, T. P., Esq.	1	1	0
Newton, J., Esq., C.E.	1	1	0
Nicholl, I. B., Esq.	1	1	0
Northwick, Lady	1	0	0
Ormerod, G. W., Esq.	1	0	0
" Miss E. A.	2	18	0
Osler, A. F., Esq. F.R.S.	2	2	0
Otter, R. H., Esq.	1	1	0
Overend, Mrs.	2	0	0
Padwick, H., Esq.	1	0	0
Paget, J., Esq.	1	6	0
Palariet H. H., Esq.	2	2	0
Palmer, Alfred, Esq.	1	11	3
Parbury, A. F., Esq.	1	0	0
Parker, Rev. Dr.	1	5	0
Parkes, C. H., Esq.	1	0	0
Parnell, J., Esq.	2	0	0
Parsons, H., Esq.	1	1	0
Paterson, Rev. T. M. B.	1	1	0
Paulin, T., Esq.	2	1	6
Peake, R. W., Esq.	1	1	0
Pearson, Col.	1	0	0
" F. F., Esq.	1	1	0
Pease, A., Esq.	2	0	0
" Sir J. W. Bt., M.P.	1	1	0
Peckover, Alexander, Esq.	1	6	0
Peek, C. E., Esq.	1	6	0
Pennant, P. P., Esq.	1	0	0
Philipps, Capt. Lloyd	1	1	0
Phillips, F. H., Esq.	1	0	0
Phipps, P., Esq.	1	10	0
Platt, S. S., Esq., C.E.	1	1	0
Pleydell, J. C. M., Esq.	1	1	0
Poulter, H. J., Esq.	2	2	0
Preston, A. E., Esq., C.E.	1	0	0
Prince, C. L., Esq.	1	1	0
Prior, R. C. A., Esq., M.D. ...	1	0	0
Rankin, J., Esq., M.P.	1	1	0
Rayner, F., Esq.	1	1	0
Read, R. Esq., C.E.	1	0	0
Rendlesham, Rt. Hon. Lord ...	3	3	0
Reynolds, J., Esq.	1	1	0
Ridout, Rev. G.	1	1	0
Roberts, I., Esq., F.R.S.	1	10	0
" J. F., Esq.	1	0	0
Robinson, Prof. H., C.E.	1	1	0
" J., Esq.	1	1	0
Robson, J. W., Esq.	1	5	0
Rofe, H., Esq., C.E.	1	0	0
Rolle, Hon. Mark.	1	1	0
Rolls, H. A., Esq.	1	0	0
Ross, Rev. J. C.	1	5	0
Rylands, T. G., Esq.	1	3	6
Scott, J. W., Esq.	2	2	0
" Mrs.	2	2	0

	£	s.	d.		£	s.	d.
Scott, Gen. A. de C.....	1	1	0	Swan, R., Esq.....	1	1	0
Searle, G. von U., Esq.	1	0	0	Swindells, R., Esq., C.E.	1	0	0
Senhouse, H. P., Esq.....	1	1	0	Tatton, T. Egerton, Esq.	1	10	0
Sharp, R., Esq. (2 years)	2	2	0	Taylor, F., Esq.	1	0	0
Sharples, G., Esq.	1	0	0	" J., Esq., C.E.....	1	1	0
Shelford, W., Esq., C.E.....	1	1	0	Tuckett, F. F., Esq.....	1	10	0
Shiffner, Miss	1	0	0	Turner, F. J., Esq.	1	0	0
Shuldham, Col.....	1	0	0	Tyndall, W. H., Esq.	1	1	0
Sidebottom, J. Esq. (See p. 9)				Vaughan, Cedric, Esq., C.E....	2	3	6
Silver, S. W., Esq.	1	1	0	Wainwright, B. C., Esq.	2	12	0
Simpson, John, Esq.	1	10	0	Walker, J. D., Esq.	1	0	0
Sing, Joshua, Esq.	1	0	0	Ward, H., Esq.....	1	1	0
Slade, F., Esq., C.E.	1	1	0	Waring, Colonel, M.P.	1	0	0
Slatter, T. J., Esq.	1	1	0	Watkins, Mr. H.	1	0	0
Smart, F. G., Esq.	1	9	6	" J., Esq.	1	0	0
Smith, B. Woodd, Esq.	1	1	0	Watson, Rev. J.	1	10	0
" Harold, Esq.	2	2	0	" J., Esq.	1	0	0
" Rt. Hon. W. H., M.P..	3	0	0	Wells, E., Esq.....	1	1	0
" Rupert, Esq., C.E.....	2	0	0	Weston, J., Esq.	1	1	0
Smyth, J., Esq., C.E.	1	10	0	Whitaker, B. I., Esq.	1	0	0
Snell, J. B., Esq.	1	0	0	White, Rev. J. H.	1	0	0
Soames, Rev. C.	1	5	0	" Gen.	1	0	0
Southall, H., Esq.	1	0	0	Wigram, J. R., Esq.....	1	5	0
" John T., Esq.	1	1	0	Wilkin, F., Esq.	1	10	0
Sparkes, J., Esq.	1	1	0	Williams, J. A. B., Esq., C.E.	1	1	0
Spence, R., Esq.	1	1	0	Wilson, Col.	1	1	0
Spicer, Miss C.	1	1	0	" J., Esq., C.E.	1	0	0
Spooner, Albert, Esq.....	1	1	0	" J. M., Esq.....	1	1	0
Stanley, E., Esq.	1	0	0	" Miss (2 years)	1	0	0
Stanton, Miss R.	1	0	0	Woodd, Basil T., Esq.	1	0	0
Stephens, H. C. Esq. M.P. (2 yrs)	3	0	0	" C. H. L., Esq.....	1	1	0
Stewart, Mark J., Esq., M.P.	1	1	0	Woodhouse, A. J., Esq.	2	0	0
" Rev. W. E.	1	1	0	Woollams, Mrs.	2	0	0
Stocker, Rev. A. H.....	1	0	0	Wortham, H., Esq.....	1	10	0
Stone, W. H., Esq.	1	15	0	Wright, Philip, Esq.	1	5	0
Stotherd, Maj.-Gen., C.B.	1	0	0	" Col. I.	1	1	0
Stuart, Col.	1	10	0	Yool, H., Esq.	2	2	0
Stubs, Peter, Esq.	1	1	0	Young, W. B., Esq.....	1	5	0
Sturt, Col.	1	0	0				

[Subsequent receipts will be acknowledged monthly in the *Meteorological Magazine*. Cheques should be crossed National Bank, and Post Office Orders drawn on Camden Road, London, N.W.]

ON THE AMOUNT OF EVAPORATION.

By G. J. SYMONS, F.R.S.

To deal thoroughly and exhaustively with this subject would require a large volume rather than an article.

In the type-printed edition of the Bibliography of Meteorology the titles are given of no fewer than two hundred and twenty five (225) books and articles upon the subject, and in this number neither consecutive articles, separate editions, nor reprints are included. If they were, the 225 would probably become 300 or 400, in seven different languages, and ranging in date from 1687 to 1887.

I should thoroughly enjoy working through this treasury of knowledge, but my time is already so filled that it cannot be—surely some one else could be found to do it.

I must therefore take a much narrower sphere, and try to bring together such data as may throw some light on the actual evaporation from large water surfaces in this and other countries.

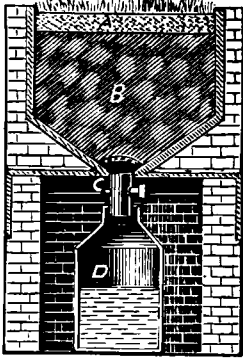
This leads to a difficulty. I strongly object to duplicate printing, but, on the other hand, it is scarcely fair to assume that every reader (or even a majority of the readers) of *British Rainfall*, 1889, remembers all that was in *British Rainfall*, 1869, or has a copy to refer to, and if not, it would be in questionable taste to so write this article as to compel the readers of the present volume to purchase all the previous ones in which the subject has been discussed.

It therefore seems to me that the best plan is to put up with the evil of repetition, and to make the present article as nearly as possible complete in itself—complete, that is, as regards the various notes and experiments reported in the several volumes of *British Rainfall* from 1867 to the present time.

But a mere *réchauffé*, however useful, would scarcely be a rightful occupant of these pages, and it is so, only because of the new matter which is to follow, viz. (thanks to the kindness of Mr. Rogers Field, M.Inst.C.E.) the results of the very elaborate experiments the organization of which was described in

our old volumes. We now at last, after twenty years, bring together the records of the far-away past, the description of the experiments designed after considering those old records, and finally the results which those experiments have given.

In *British Rainfall*, 1867, p. 9, I pointed out the effect of various causes such as soil, subsoil, aspect, shelter, climate, &c., upon the amount of evaporation, and asked rather scornfully, "How many of these requirements are fulfilled by a few pints of water in a metal vessel 4 or 5 feet above the ground?" and I went on to say, "Yet this is the almost universal method of determining the amount of evaporation. Was I not justified in saying 'I don't believe in evaporators.'" Then I proceeded to sketch the following scheme—



"It appears to me that a rather troublesome and costly process is necessary before we can at all presume to decide on any instrument for general use, and that it should take the form of a series of experiments, with compartments of a cubic yard each, sunk in the ground, waterproof, funnel-shaped at the bottom, with taps and cans. The simplest mode

of carrying it out would probably be to cut a trench about 30 ft. long, and 6 ft. deep, in a spot where perfect drainage could be secured, and then form the cubes in brickwork, lined with Portland cement, leaving a sunk path in front, to give access to the cans, as shown in the section of one. The cubes could be filled with various substances; and by their modification, and at one time leaving the taps (C) open, and another closing them—by leaving them with no water but the rain, and at other times keeping their contents in a state of saturation, we should not only go far beyond anything that has been done before, but should probably be led to some simple form of instrument which, even if not itself correct, might bear a known per-centage of error, and be available for differential results.

Water	Grass on Clay.	Grass on Sand.	Grass on Soil of District.	Corn on Soil of District.	Roots on Soil of District.	Soil of District. No Vegetation.	Peat.	Water
-------	----------------	----------------	----------------------------	---------------------------	----------------------------	----------------------------------	-------	-------

GROUND PLAN.

In the same volume (p. 43) Mr. Isaac Fletcher, M.P., F.R.S., dealt with the subject. He stated that Luke Howard's observations near London had given the evaporation as about 20 inches, but that "as the vessel was covered it is obvious that this amount must be far too small." Then he quoted Dr. Miller's observations during twelve years at Whitehaven, where continuous daily observation gave an average of 29·66 in. There the evaporator, a pan 8 inches in diameter (depth not stated), was placed in a small garden during the day, but in time of rain and at night was placed under a sort of summer-house. Evidently a bad arrangement, since everything depended on its prompt removal, without spilling, when rain came on. Lastly, Mr. Fletcher described his own as an 8-inch cylinder, $4\frac{1}{2}$ inches deep, and with one inch deep of water in it, $5\frac{1}{2}$ feet above the ground, with a rain gauge by its side, so that the additions from rain were known, and the loss was easily measured. He rightly pointed out that this instrument had three errors, two tending to make the loss too great, viz.—(1) undue heating of the metal, and (2) outsplashings in heavy rains, while the third error made the loss too small, viz., the sheltering of the water from wind and sun, by the sides of the vessel. He gave the monthly values for 4 years, and remarked that the average was 47 inches, "a quantity vastly in excess of the amount arrived at by Mr. Howard and Dr. Miller, but 'he believed' more correct than either." How delusive this instrument was will be shown subsequently.

During the summer of 1869, Mr. Rogers Field, being professionally engaged in matters wherein the amount of evaporation was of much importance, consulted me about it; I made some elementary experiments at Camden Square, and Mr. Field hunted up the results obtained by French Engineers. In the autumn of that year we, at the Exeter meeting of the British Association, read a joint paper upon the subject. This paper, with much additional matter, formed an appendix of 26 pages to *British Rainfall* 1869. Of course, I cannot reprint all that, and therefore proceed to epitomise it as much as possible, but as it was already condensed this is not easy.

In our joint paper we quoted the results published by two skilled observers, one living in a very wet district reporting the evaporation to be 46 inches, and the other in a very dry

district (and where, therefore, the evaporation must be greater) reporting less than 20 inches, and stated that such inconsistent records could arise only from employing improper methods.

We showed that Professor Daniell had already condemned as absurd and useless all the evaporators proposed up to his time.

We then referred to the experiments of various French engineers and showed that with the old-fashioned evaporators the following values had been given :—

Paris	55 inches.
Pontine Marshes	93 ,,
Nantes	71 ,,
Marseilles	98 ,,

whereas the evaporation from zinc-lined masonry tanks, 8 ft. square and 1½ ft. deep, was :—

St. Jeane de Losne	22 inches.
Dijon (1839-45).....	25 inches
„ (1846-52).....	26 ,,
Pouilly	22 ,,
La Roche sur Yonne (1841-45)	19 inches
„ „ (1846-50)	22 ,,

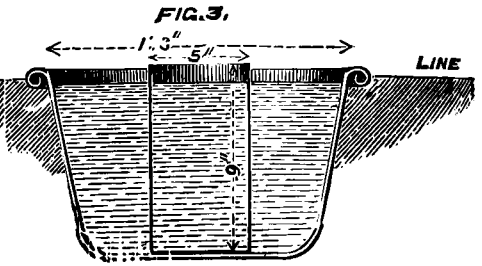
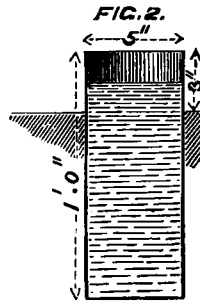
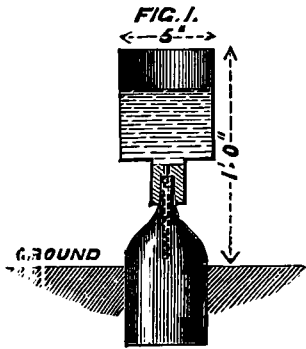
At Dijon, in 1851, M. Ruinet had by the side of the large tank, a small basin, 1 foot square ; the evaporation was :—

Large Tank, 20·7 ^{in.}	Small, 29·1 ^{in.}	Excess of small, 40 per cent.
---------------------------------------	----------------------------------	-------------------------------

We then mentioned the experiments made at St. Helena, by Major Phillips, who had two glass vessels about 9 inches deep and 5 inches in diameter, of which one was fully exposed to the sun, and the other placed in a large tub of water, so that that inside the cylinder was always surrounded by water up to about the same level. No account was given of how the measurements were made, and the recorded evaporation was large, but the instructive fact is, that the unprotected cylinder lost nearly half as much again as the one surrounded by water.

After describing the hook gauge which enables the loss from any surface of water to be determined with ease and accuracy we reported the results of the Camden Square experiments during part of July and August, 1869.

The evaporators used were the following :—



An excellent arrangement for enabling the sun to heat the water as much as possible.

The cheapest possible evaporator, partly protected against heating, but too small and unduly affected by the sides, which must be high to prevent out-splashing and overflow.

A reproduction of Major Phillips', in-splashing and out-splashing nearly balance, but it breaks with the first frost.

July 22 to Nov. 19.	Evaporated	15.75 in.	13.57 in.	9.72 in.
		162 per cent.	140 per cent.	100 per. cent.
July 22 to Aug. 12.	Average excess of temp. above 65°	15°·7	10°·8	8°·8
		178 ratio.	123 ratio	100 ratio
	Evaporated	4.37 in.	3.13 in.	2.46 in.
		178 per cent.	127 per cent.	100 per cent.

The above shows how largely the question is affected by the temperature of the water; it is indeed curious how much light was thrown upon the question by these few simple experiments. For example, the following paragraph really takes up the subject and shows wherein lay the great fault of the old instruments and the chief thing to be secured in an accurate one.

“We have already pointed out that we consider the accuracy of an evaporator is largely dependent on its capabilities of retaining the temperature of the contained water at as nearly as possible that of large volumes of water, such as reservoirs, rivers, and ponds. Hitherto we have not been able to institute regular comparisons of the temperature of the water in our experimental vessels with that of the surface of large bodies of water. Surface temperature alone

is concerned, because therefrom alone can evaporation take place. On the few instances when we have done so we have found that the water in the water-surrounded glass cylinder (Phillips, Fig. 3) has been nearly identical with that of a rather shallow reservoir one acre in extent. We do not, however, consider our observations sufficiently numerous to prove this."

The article in *British Rainfall*, 1869, then proceeded to describe the floating slate cisterns, 3 ft. square and 1 ft. deep, which Mr. Greaves employed on the river Lee, and which gave for the years 1860—69 an average of 20.9 inches. The article then described and gave the annual evaporation from each of about 20 patterns of evaporator, but I think that here it will be sufficient to notice only those of which results for several years are given, and I arrange them in decreasing order, so that the evaporator which produced the greatest loss heads the list.

Mr. Isaac Fletcher's comes first with an evaporation of nearly 48 inches. Considering that this contained only one inch deep of water in an exposed metal can, it is perhaps remarkable that the amount was not even greater.

Mr. Proctor's, of Barry, Forfarshire, comes next with 34 inches; this was a shallow square vessel, but containing a thicker layer of water than Mr. Fletcher's.

Mr. Milner's, at Wakefield, which gave 31 inches, was, I believe, much like Mr. Proctor's, but higher above the ground.

Mr. Sharples, of Blackpool, used a 10 inch diameter funnel nearly full of water, and placed in a large tub of earth partly sunk in the ground; this gave $29\frac{1}{2}$ inches.

Mr. Eaton, at Little Bridy, in Dorset, used a circular copper dish 8 inches in diameter, $5\frac{1}{2}$ inches deep, of which $1\frac{1}{2}$ inches were sunk in the soil of a lawn. The usual depth of water was one inch, and therefore it was surrounded by metal $4\frac{1}{2}$ inches higher than itself. Mr. Eaton noticed that in July, 1859, the temperature of the water was occasionally between 90° and 100° degrees. The average evaporation for three years was 26 inches.

Mr. S. H. Miller, of Wisbeach (to whose other work on this subject I hope to refer hereafter), had two evaporators. No. 1, which claims notice here, was an 8-inch cylinder about 4 inches deep, placed inside a larger cylinder filled with sand kept constantly wet; the evaporation from this averaged 21 inches.

Mr. Watson's results from Bolton come next, and it is not easy to understand why his evaporator, which much resembles Mr. Fletcher's, gave less than half the amount of evaporation. As a fac-simile of his evaporator was subsequently experimented with, I defer full description and engraving to a later part of this article. From 1856 to 1869 the average from this apparatus at Bolton was just under $20\frac{1}{4}$ inches, but for 39 years, 1831 to 1869, it was $22\frac{1}{2}$ inches.

The other two evaporators, being observed under cover, are hardly worthy of notice.

There is one remark in the description (on p. 166) of Dr. Buist's evaporator which is too important to be passed over:—

“In India the evaporating dish ought never to be exposed to the sun* unless the difference of evaporation at different temperatures with the same breeze is meant to be ascertained. The water in an evaporating dish in the sun will often rise to a temperature of 120° , while that of the atmosphere around is no higher than 80° ; this only occurs with small masses of water—so as to have nothing analagous to it amongst the phenomena of nature desired to be investigated—the surface of the ocean seldom differing more than a few degrees from the air around.”

In the *Meteorological Magazine*, Vol. V. (1870) p. 70, Mr. G. Dines gave the results for two months of five evaporators, of which the largest was $1\frac{1}{2}$ feet in diameter, and the others were of various smaller sizes—the large one did not lose two-thirds of that lost by the smallest. But probably even the largest lost far too much, for Mr. Dines compared the temperature of the water in it with that of the river Mole, and found the readings in the evaporator to vary in April from 32° to 77° , while those in the river ranged only between 39° and $60^{\circ}3$; and in June, in the evaporator, from 33° to 84° , but in the river only from 46° to $66^{\circ}8$. Mr. Dines also mentioned that in a room of which the temperature was 62° water of that temperature evaporated at the rate of $\cdot 003$ inch per hour (about 26 inches a year), and

* This is true as regards an “evaporating dish,” but obviously a reservoir or canal or lake is exposed to the sun, and a true representation of the loss from their surface can be obtained only by putting the water from which the loss is to be observed in similar conditions.—G. J. S.

water at 88° evaporated at the rate of $\cdot 015$ inches per hour (about 131 inches per year).

In the autumn of 1869, Mr. Rogers Field having obtained a grant towards expenses from the Royal Society, and the Rev. C. H. Griffith, of Strathfield Turgiss, having kindly offered the use of part of his field, and to make the requisite observations, a rather elaborate scheme was drawn up, and twenty evaporators were started. The majority failed with the first hard frost, but one has gone on for twenty-two years, and looks as if it would last out the century easily. It will probably be best to treat them all in numerical order, describing each and giving its life history, and then subsequently to deal with the results.

LOCALITY.

Strathfield Turgiss Rectory, near Basingstoke, where the experiments were carried out, is in the extreme north of Hampshire (Lat. $51^{\circ} 20' 23''$ N. and Lon. $1^{\circ} 2' 30''$ W.), 200 feet above mean sea level, surrounded by fields which slope very gently to the river Loddon, which is but a few feet lower, and about half a mile N.N.W. of the Rectory. Fig. 3 gives a plan of the space, about 680 square feet, specially appropriated to the experiments. It will be noticed that all the numerals do not appear on the plan of the enclosure, the reason being that a few of the evaporators were (in order to reproduce as nearly as possible the conditions in which their inventors had used them) necessarily placed in other parts of the ground. It should also be mentioned that the utmost care was taken in reproducing evaporators invented by deceased as well as those by living inventors, that, both as regards dimensions, construction, and mounting, they should be as faithful copies as possible.

The same Roman numerals will be used for each instrument throughout this article, and in the engravings.

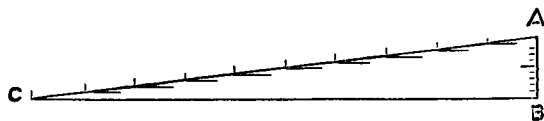
HOWARD'S (UNDER COVER).—I.

The following description is from the *Climate of London*, by LUKE HOWARD, F.R.S., 2nd edition, p. xix :—

“The graduated measure for the rain being numbered on the opposite side of the scale downward, serves also to ascertain the amount of *Evaporation*. For this purpose, a cylindrical tinned copper vessel is employed, of five inches in diameter within, furnished with a rim to prevent spilling, in which is a lip, set on clear

of the cylinder. Two measures, or an inch, of water being poured in, fills two-thirds of the cylinder ; the vessel is then placed near the ground, in a situation where it may be sheltered from rain, and have the sun's rays, without reflection. At the end of twenty-four hours, or a longer period, extending to a week if desirable, but regulated by the season of the year, the water being returned into the measure, the quantity which is evaporated may be read off, and the vessel replenished. For warmer climates, or longer periods of observation, the depth of the vessel may be increased, and a greater number of measures put in."

The author subsequently suggests the employment of a divided glass, placed diagonally, as a facile mode of measurement ; I hardly



need illustrate this plan, it is so simple. Let A B be one inch, and A C ten inches, then it is evident the water as reduced by evaporation, will cut the scale at points, travelling downwards, and at the same time towards C, *i.e.*, along A C, and if the scale be as above described, the linear distance travelled by the water line will be ten times greater than the actual depression, hence considerable delicacy of reading may apparently be expected. In practice, however, owing to the action of wind on the water surface, and the cohesion of the water to the scale, this mode of observation is most unsatisfactory.

With the apparatus above represented, and observed under cover as directed, Howard found the evaporation to be about 20 inches per annum.

It is evident that it would be rather difficult to comply precisely with Howard's requirement, that the instrument be placed "where it may be sheltered from rain, and have the sun's rays without reflection." The nearest approach to these conditions seemed to be on grass beneath the large old Kew thermometer screen, which was quite open at the lower part all round, and yet allowed no rain (or *very* little) ever to reach it. This gauge worked for several years without serious injury.

MILLER'S (UNDER COVER).—II.

This consisted of a zinc pan, 8 in. in diameter, 3 in. deep, which was placed on a shelf just above the eaves of Martin's thermometer stand, 5 ft. above the grass. Frequently interrupted by frost.

RAIN GAUGE.—III.

It would have been better not to have numbered this, but to have used a letter, because it tends to confusion, but it would make more confusion now to change all the numerals, and therefore I leave it. This was an ordinary 8 in. Glaisher gauge and was used to indicate the amount of rain falling into evaporators Nos. IV. to X. inclusive, all which had their orifices at the same height above grass as this gauge, namely 4 in.

TANK.—IV.

This has throughout been used as the standard. It is not quite so large as the evaporators used by the French engineers, but was as large as could conveniently be sent to the Rectory and employed. It is made of stout galvanized iron, 6 ft. square and 2 ft. deep; if full, it would therefore hold 450 gallons, but the water is kept usually 3 in. below the top, so that it generally contains about 400 gallons. The 3 inch margin is required to afford space for sudden heavy rains, and to prevent wavelets from washing over the edge. After its railway and cart journey, it was thought possible that some joint might leak, and it was therefore set upon a temporary stage, over its future position, filled with water, carefully wiped, and subsequently examined for the slightest trace of moisture on the outside, but none was found.* It was then lowered into a hole 1 ft. 9 in. deep, so that the rim was 3 in. above the grass. The readings have always been taken by the hook gauge frequently described in these volumes. At first some difficulty was experienced from the irregular level of the water, owing to waves, but this was conquered in May, 1871, by providing a "still water pond," by putting a deep zinc box with a small hole in its bottom, so that while the waves were shut out, the water inside remained at the average level. About the same date arrangements were made whereby the level of the water in the tank was automatically recorded by clockwork in one of the rooms of the Rectory, but as that branch of the subject does not affect the question of the total amount of evaporation, I do not pursue it here.

WHITE EARTHENWARE.—V.

A white earthenware jar, 5 in. in diameter, 10 in. deep, buried

* About 15 years afterwards it was emptied, raised, sent by cart, train, and waggon to Camden Square, and before being used there was similarly tested, with the same result.

6 in. in the earth, with about 8 in. deep of water in it, so that the rim was 4 in. above ground, and the water about 2 in. below the rim. One burst in the first frost ; a second, obtained in the spring of 1870, lasted till winter, then burst, and was not replaced.

TIN.—VI.

This was identical with Fig. 2 of the early Camden Square experiments (see p. 22) ; a black japanned tin cylinder, 5 in. in diameter, 1 ft. long, buried 8 in. in the earth, and with its rim 4 in. above the ground. This lasted several years.

TIN CONSTANT.—VII.

Similar in all respects to No. VI., except that in order to test the influence of the elevation of the sides of an evaporator in shutting off wind, and thereby decreasing the evaporation, this was kept fuller of water, 1 in. below the rim, and to prevent out-splashing or loss, an overflow pipe was inserted 1 in. below the rim leading to a bottle, in which any such overflow was stored, and could be subsequently measured. This was a very troublesome evaporator : it burst several times, the pipe leaked and was repaired, and early in 1871 it was finally given up.

PHILLIPS' CONSTANT.—VIII.

Nearly identical with the one used at St. Helena and Camden Square, as already described, but having in addition an overflow arrangement like No. VII. The glass cylinder was 5 in. in diameter, and 12 in. deep ; it stood in a red earthenware pan, 20 in. in diameter, and 15 in. deep, and buried about 14 in. in the ground. In order to keep the glass steady, it was pressed into a mass of clay about 4 in. deep, with which the bottom of the pan was filled before the water was poured in, and which water subsequently filled the earthenware pan nearly up to its brim and up to the level of the water inside the glass. A glass tube was attached to the inner cylinder 1 in. below the rim, which led to an overflow chamber similar to that provided for No. VII. Several modifications were tried, but all failed in frosty weather.

MILLER'S SAND.—IX.

This consisted of two vessels in zinc. The inner one 8 in. in diameter and 4 in. deep, standing in one 12 in. in diameter and 5 in. deep. The outer one was first filled with sand to an even depth of

EVAPORATORS USED AT STRATHFIELD TURGISS.

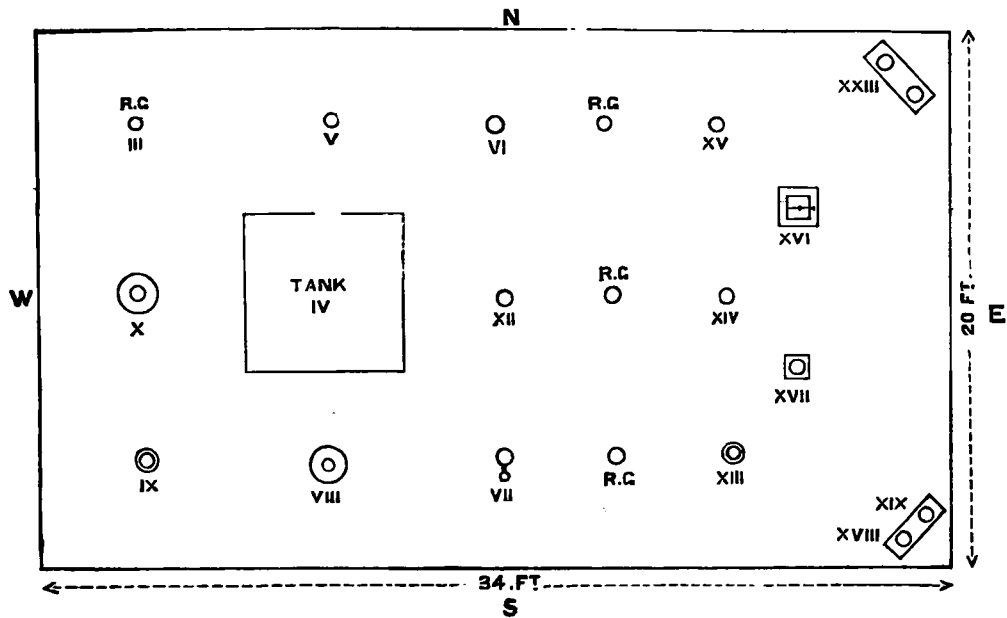
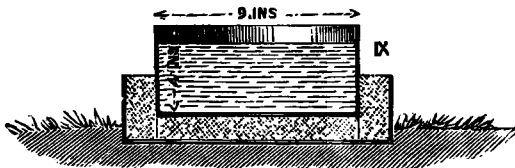


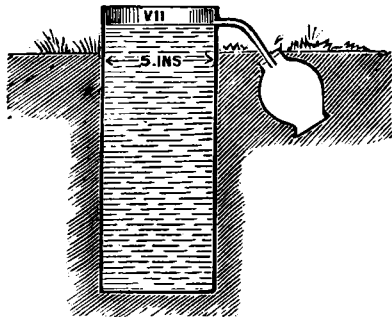
Fig. 4.



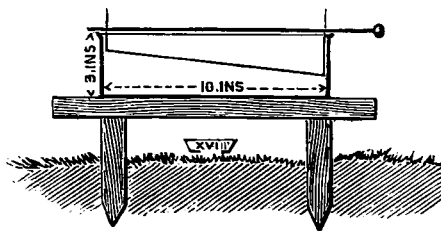
I.



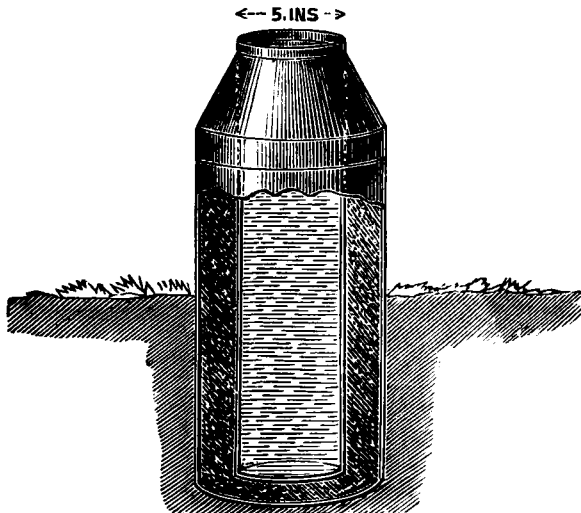
IX.



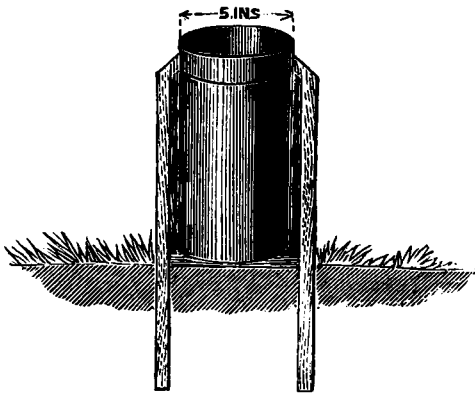
VII.



XVI.



XIII.



XVII.

2½ in. The inner vessel was then placed in the middle and the outer vessel was filled to its brim with sand, so that there were 2½ in. below the inner vessel and 5 in. deep all round it. The sand was then flooded with water, and the inner vessel nearly filled with water, which thus was surrounded by and stood upon wet sand. What with the freezing of the water and of the wet sand, this inner vessel soon became much out of shape and burst repeatedly. Moreover, it would not remain steady; this was obviated by providing three legs to pass through the sand and rest on the outer vessel, but it was burst again by the next frost and abandoned.

PHILLIPS'.—X.

Similar to No. VIII. in all respects, except that it had no overflow. This simpler form, although it burst once, was far better than No. VIII. and lasted through two winters.

RAIN GAUGE.—XI.

This was an ordinary 5 in. Casella's bottle gauge and had its orifice 1 ft. above the ground so as to indicate the amount of rain falling into evaporators Nos. XII. to XVII. inclusive.

CASELLA'S CAN (SALT WATER).—XII.

A copper can 5 in. in diameter and 7½ in. deep. fixed on a dwarf stump, so that its rim was 1 ft. above ground. As this instrument was almost precisely represented by No. XIV., it was thought desirable to add a small quantity of salt to the water, thereby securing (1) continuity of record through the winter, and (2) comparison of the evaporation from fresh and from salt water. No precise record of the specific gravity was kept. It stood the winter of 1870, but burst in that of 1871.

FELT PROTECTED.—XIII.

This was a tin cylinder 5 in. in diameter and 12 in. long, surrounded by an outer case 8 in. in diameter and 1 ft. 4 in. long, and then tapering to 5 in. in diameter at ½ in. from the top, its total length being 1 ft. 8 in. The space between the two cans was filled with boiler felt so as to diminish the influence of air temperature on the inner vessel. At first the rim was 1 ft. above ground, but on January 1st, 1871, it was lowered 8 in. and so became level with the tank (No. IV.) This burst once in the winter of 1871.

TIN.—XIV.

This, as already stated, was almost identical with No. XII., but it

was tin, not copper, and 12 in. deep instead of $7\frac{1}{2}$. Whether owing to the metal, or to the salt in the water, No. XII. stood the frost far better than No. XIV., which burst repeatedly, and had to be abandoned.

CASELLA'S BOTTLE.—XV.

This was one of the three tried at Camden Square and is represented in Fig. 1 (p. 22). It consists of a cylinder 5 in. in diameter and $5\frac{1}{2}$ in. long. resting on the neck of a stone bottle, part of the body of which is sunk in the ground, so that the rim of the evaporator is 1 ft. above the soil. This burst twice within the first six weeks, lasted through the summer, burst in the following winter, and was abandoned.

PROCTOR'S.—XVI.

Designed by Mr. Proctor, of Barry, Forfarshire, and consisted of a zinc box 10 in. square and 3 in. deep, placed upon a dwarf stool, so that its rim was 1 ft. above ground. Mr. Proctor read his by the contact line of the water on a sloping scale, but owing to wind and capillary action this was most inaccurate and hook gauge readings were substituted. It, however, was repeatedly burst and bulged by frost and had to be abandoned.

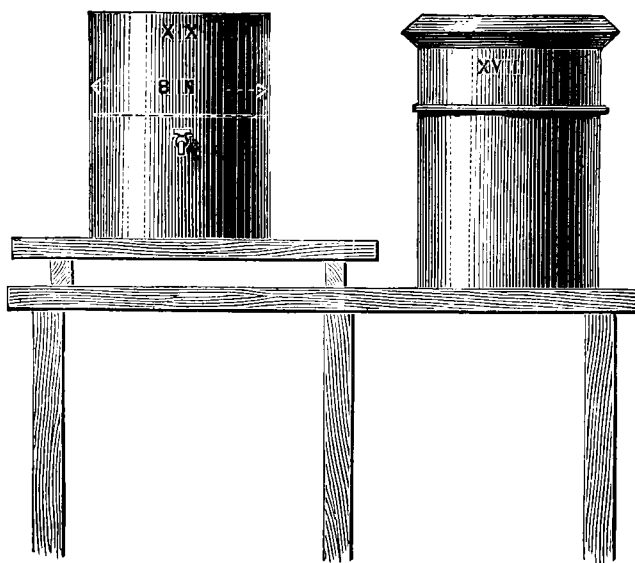
SHARPE'S.—XVII.

This was analogous to No. XIII., but the protection was afforded by a square casing of inch deal boards bevelled at the top, and finishing 1 in. below the rim—however, it was a failure, it was burst by frost twice in the first year.

FLETCHER'S.—XVIII & XIX.

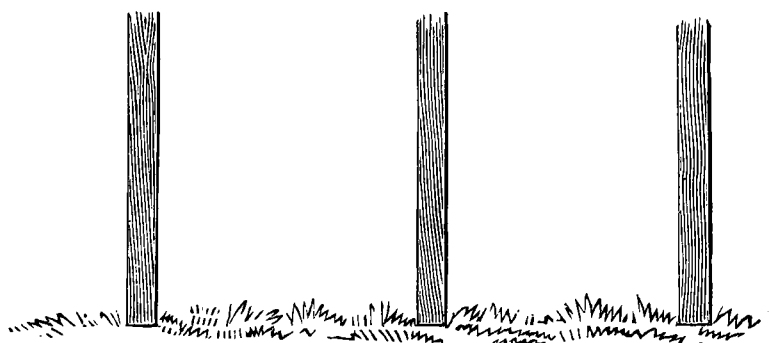
This was a reproduction of the arrangement adopted by Mr. Isaac Fletcher, M.P., F.R.S., at Tarn Bank, Cumberland. The rain gauge and evaporator, each 8 in. diameter were side-by-side, and 5 ft. above the ground; the water for evaporation was 1 in. deep, and was placed in the upper part of the evaporator, the sides of which rose $3\frac{1}{2}$ in. above it. Measurement was made by running off the water by the tap, and allowing for rain (if any); the deficiency gave the amount evaporated. It worked regularly for 11 months, burst repeatedly in the winter 1870–71, the tap became leaky early in 1871, and was plugged, other arrangements being made for measurement, but in the autumn it burst again and was abandoned.

EVAPORATORS USED AT STRATHFIELD TURGISS.



XIX

XVIII.



XXIII.

TIN (ON ROOF).—XX. & XXI.

No. XX. was an 8 in. rain gauge in, and 1 ft. above, the centre gutter of the roof of the Rectory, and 30 ft. above ground, and No. XXI. placed close to it was a tin can precisely similar to No. XIV. It burst within a month of being put up, and being repaired lasted until the frosts of the next winter, when it again burst and was abandoned.

WATSON'S.—XXIII.

This was a *fac simile* of the evaporator designed by Dr. John Dalton, F.R.S., and as already mentioned used for nearly 40 years by Mr. Watson, at Bolton, Lancashire. The rain gauge and the evaporator are each 10 in. in diameter, and 3 ft. 6 in. above the ground. The evaporator has an overflow pipe, so that when heavy rain falls the cylinder does not fill up, but the water passes into the large (too large) stone bottle below. The funnels are fixed to the table, but on removing the slabs BB, the bottles can be withdrawn and their contents measured. The arrangement would be improved by the bottles being enclosed as in a cupboard. In a sharp frost one bottle burst. This evaporator was not ready for observation until October 24th, 1870.

The results quoted in the joint paper by Mr. Rogers Field and myself, read before the British Association, and already mentioned, could not fail to convince any one that the key to the whole question was to be found in one item, the temperature of the water. Therefore in the experiments at Strathfield Turgiss, this element has been carefully examined. A maximum and a minimum thermometer were enclosed in a box pierced with many holes, and the box was sunk in the River Loddon, about 1 ft. below its surface. The readings of these thermometers were compared with those of another pair at the bottom of the tank, and a third pair 1 ft. from the bottom. Very nearly simultaneous readings were taken of the water 1 in. below the surface of the Loddon, and at the same depth in all the evaporators in which it was possible so to do.

The reduction of the enormous mass of observations afforded by this collection of apparatus naturally took a very long time, and yet Mr. Rogers Field had yearly less and less leisure to complete it. He has now, however, most handsomely placed all the papers in my hands, and I shall proceed to point out the conclusions which may be drawn from them as to the amount of water annually taken up

from a reasonably large surface of water. The records from the tank seem to lead to important theoretical conclusions, but that portion is much better left in Mr. Rogers Field's hands, and I hope that he may soon find time to bring it out.

From the descriptions and notes upon the evaporators which have already been given, it will have been seen that many were not only utterly useless during frost, but were destroyed each time that a sharp frost occurred. They were therefore of use only as beacons showing what to avoid ; and several of them were so, not merely because they failed with frost, but because they were very bad indeed when the temperature was high.

It will, I think, tend to clearness if, instead of taking the evaporators in numerical order, I take first the Tank No. IV., and state why I consider that it was far and away the best of the lot. We wish to know the evaporation from large bodies of water—not that from a puddle in a dusty road, or the water left in a nearly empty horse trough—therefore, the larger the volume of water experimented upon, the more nearly will it resemble that with which we are concerned. The tank held 400 times as much as any one of the others.

But there was stronger evidence even than that. I have mentioned that the temperature of the River Loddon was carefully compared with that in the evaporators. Not one of them agreed so well with Loddon as did the tank.

As regards temperature in the tank. The surface temperature was taken at each time of measurement, and, as already stated, there was a max. and a min. thermometer suspended 1 ft. below the surface, and another pair rested on the bottom. As warm water is lighter than cold, it was to be expected that generally the 1 ft. thermometers would read higher than the bottom ones; and the surface higher than either ; but the rule would not hold (1) when the temperature was below that of the greatest density of water ($39^{\circ}2$) ; (2) when there was any ice ; (3) for a short time after a shower of cold rain. It has also to be remembered that the bottom thermometers were separated from the earth beneath, by only one-tenth of an inch of iron, so that the influence of soil temperature would be perceptible.

On examining the thousands of temperature readings, indications of nearly all these causes are to be found, but the average differences are small, *e.g.*, the mean at 1 ft. was about half a degree higher, and at the surface about 3° higher, than at the bottom. In individual

cases, of course, the differences are much greater, about a dozen times in a year amounting to upwards of 10° . The most remarkable cases were :—

		Surface.		1 foot.		Bottom.		Excess at Surface.
1874.	July 14th ...	84·7	.....	71·6	.....	71·3	.....	13·4
1875.	June 3rd ...	81·2	.....	68·1	.....	68·0	.....	13·2
1876.	July 14th ...	88·7	.....	74·9	.. ..	73·0	.....	15·7

But even on this last occasion the water was cooler than the air, the air temperature being $89^{\circ}4$, and the water $88^{\circ}7$.

Now, a tank resembles a lake or a reservoir rather than a river, but there was no lake handy, and therefore the river Loddon was selected for comparison, and, before considering the subject, it is well to mention that in a river the water is always rolling over on itself, so that the effect of specific gravity, whereby in a lake or tank the cold heavy water goes to the bottom and the light warm water to the top, has no chance. Sluggish though the stream may be, the water which is at the bottom in one hundred yards may be at the top in the next. And this is proved by the fact that in the river the difference between the bottom and the surface was sometimes one way, sometimes the other, and rarely reached a degree. This must not be forgotten further on, but at present it will be well to think only of the water temperature, which really governs the amount of evaporation, and that is the temperature of *the surface* of the water. In the following table I give the average temperature of the surface of the river and of the tank, and the difference between them :—

	River.		Tank.		Difference.
January.....	45·0	.....	42·4	.....	—2·6
February	48·0	.....	45·2	.....	—2·8
March	50·2	.....	50·3	.....	+ ·1
April	56·4	.....	60·0	.. ..	+3·6
May	59·6	.. ..	61·4	.....	+1·8
June	68·2	.....	73·9	.. ...	+5·7
July	72·0	.....	76·0	.....	+4·0
August	68·3	.....	70·6	.....	+2·3
September	61·5	.....	60·5	.....	—1·0
October.....	57·4	.....	55·5	.....	—1·9
November.....	48·6	.....	45·2	.....	—3·4
December	45·7	.....	42·2	.. ...	—3·5
Year	56·7	.....	56·9	.....	+ ·2

This shows, that though on the average of the year the surface of the tank and of the river are the same, in summer the tank surface is about 3° hotter than that of the river, and in the other months cooler. Even in summer the tank surface is not always the hotter,

but occasionally, on very calm and sunny days the excess is very large, such as

		Tank.	Surface of	River.		Excess of Tank.
1872.	June 18th	88 ⁰ ·7	.....	76 ⁰ ·0	.....	12·7
1875.	June 3rd	82·1*	.....	70·3	.....	11·8
1876.	July 14th	88·9	.....	76·6	.....	12·3

It is curious to notice how well these values agree with those given in illustration of extreme differences between the surface and the bottom of the tank ; this coolness of the river surface is due to that churning up of the water in the river, which I have already mentioned.

My own conclusion, from the temperature records of the tank and the river, is, that the evaporation from the tank accurately represents that from the surface of a large body of nearly stagnant water, such as a pond, lake, or reservoir, but is rather larger than occurs from rivers, and to a less extent than from canals, where the water is in progressive motion.

I next proceed to the extremely valuable table which Mr. Rogers Field has had prepared, giving the total evaporation from the tank during the fourteen years 1870-83.

* It fell to 81·2 when the 3 p.m. readings were taken (*see* p. 33).

MONTHLY EVAPORATION FROM THE TANK AT STRATHFIELD TURGISS, 1870--83.

Months.	1870	1871	1872	1873	1874	1875	1876	1877	1878	1879	1880	1881	1882	1883	Mean.	Max. Mnthly.		Min. Monthly		Max. on any one day.
																Amnt.	Year.	Amount	Year.	
Jan. ...	in. +04	in. 16	in. +16	in. 29	in. 13	in. +13	in. 05	in. 10	in. 14	in. 47	in. 21	in. 34	in. 11	in. 24	in. 14	in. 47	1879	in. +16	1872	in. 07
Feb. ...	25	23	40	+03	23	32	08	47	11	03	33	04	32	36	22	47	1877	+03	1873	08
March	1 15	1 27	86	74	98	1 00	1 00	68	1 31	86	1 21	96	1 38	1 21	1 04	1 38	1882	68	1877	13
April..	2 45	1 68	1 73	1 85	1 84	1 81	1 65	1 89	1 54	1 08	1 09	2 38	1 97	1 59	1 75	2 45	1870	1 08	1879	17
May...	3 61	3 08	2 51	2 73	2 54	2 55	2 81	2 17	2 33	1 78	2 75	2 66	3 66	2 45	2 69	3 66	1882	1 78	1879	20
June..	4 26	2 56	2 69	2 61	3 27	3 09	3 02	3 68	2 73	2 33	3 04	3 39	2 78	3 24	3 05	4 26	1870	2 33	1879	24
July ...	4 78	3 17	3 88	3 66	4 25	2 78	4 04	3 28	3 47	2 01	3 02	4 31	3 16	3 12	3 50	4 78	1870	2 01	1879	24
Aug...	3 62	3 08	2 87	3 36	(2 98)	2 43	(29 4)	2 70	3 31	(2 53)	2 55	2 27	2 42	2 85	2 85	3 62	1870	2 27	1881	20
Sept...	1 92	2 11	1 82	1 55	1 64	(1 59)	(1 53)	1 45	1 68	1 42	1 37	1 13	1 56	1 63	1 60	2 11	1871	1 13	1881	12
Oct. ...	1 02	80	51	79	68	44	(82)	90	70	82	93	98	71	83	78	1 02	1870	44	1875	12
Nov....	49	34	31	43	53	26	22	13	25	45	10	35	55	60	36	60	1883	10	1880	09
Dec....	10	17	15	07	04	+12	+04	13	+09	+12	24	02	01	18	05	24	1880	+12	1875 } 1879 }	08
Year. .	23 61	18 65	17 57	18 05	19 11	16 02	18 12	17 58	17 48	13 66	16 84	18 83	18 63	18 30	18 03	...	...	...	...	...
Max. in one day	...	...	22	20	21	17	20	18	21	14	20	24	24	24	...	...	...	...	...	...

Bracketed values partly computed,

I have so much material yet to deal with that I must resist the strong temptation to remark fully on this very important table. I have already pointed out that the summer surface temperature of the tank is somewhat higher than that of the Loddon; hence, as the mean evaporation from the tank was 18 inches, that from the river would be less. Moreover, it is important to recall the fact that the French engineers, even in the sunny south of France, found that the evaporation was but about $22\frac{1}{2}$ inches; Mr. Greaves found 21, and in the above tank Mr. Griffith obtained 18.

If I complete the history of the tank, it will, I think, not merely confirm the above results, but perhaps throw some light on the small difference of 3 inches between Mr. Greaves and Mr. Griffith. During 1884 the tank was removed to Camden Square and placed in my garden, and has been read regularly and the daily values printed in *British Rainfall* from 1885 onwards. The totals have been—

1885.	1886.	1887.	1888.	1889.	Mean.
15·62 in.	14·65 in.	16·78 in.	12·60 in.	13·03 in.	14·54 in.

Thus the average here is $3\frac{1}{2}$ in. less than at Strathfield Turgiss, and this is, I have no doubt, due partly to the diminished intensity of sunshine produced by the smoke of London, and partly to the fact that, owing to the height of the house and the proximity of garden walls, the wind has not such free access to it as was the case at Strathfield Turgiss. Possibly the excess of 3 in. which Mr. Greaves obtained over Mr. Griffith was due to Mr. Greaves' tank being anchored in the middle of a stream, where *it is said* that there is always a breeze.

I can now return to the miscellaneous collection of so-called evaporators which I have already described, and try to give some account of the results obtained from them. It will have been noticed that few were able to stand frost, hence (even after estimating values for missing observations) scarcely half a dozen gave returns which were complete for the year.

When the early frosts of 1870 were over, all dilapidations were attended to, and until the frost came in the autumn all went well. It will be seen by the table already given of the tank values that the summer of 1870 was noticeable for large evaporation, and therefore the period was an exceptionally good one for the investigation.

Evaporation in each month April to September, 1870.

		April. in.	May. in.	June. in.	July in.	Aug. in.	Sept. in.	Totals in.
Under cover.	I. Howard	1·24	1·34	2·78	2·86	3·23	2·99	14·44
	II. Miller	1·91	2·03	2·78	3·26	2·23	1·36	13·57
4 inches above ground.	IV. Tank	2·45	3·61	4·26	4·78	3·62	1·92	20·64
	V. Earthen Jar	2·92	4·10	5·88	7·74	5·84	2·29	28·77
	VI. Tin	4·78	6·55	8·38	9·68	8·25	3·57	41·21
	VII. „ Constant...	4·01	5·83	7·97	9·50	8·15	3·27	38·73
	VIII. Phillip's „	2·79	4·41	...	...	...	...	...
	IX. Miller's Sand	2·85	4·47	5·37	6·00	5·51	2·49	26·69
	X. Phillips	2·96	4·40	5·39	5·59	5·19	2·14	25·67
1 ft.	XII. Casella (salted) ...	5·39	7·38	9·06	9·98	8·40	4·23	44·44
	XIII. Felt-protected ...	4·48	6·55	7·84	8·64	7·67	3·76	38·94
	XIV. Tin	5·66	7·49	9·52	10·31	8·89	4·68	46·95
	XV. Casella's bottle ...	5·93	7·24	9·16	9·87	8·34	4·42	44·94
	XVI. Proctor	4·28	5·80	7·39	7·45	6·13	3·31	34·35
	XVII. Sharpe	4·10	9·25	7·74	8·70	7·85	3·64	41·26
5 ft.	XIX. Fletcher	4·14	6·23	7·28	7·52	6·00	3·47	34·64
30ft.	XXI. Roof tin	4·63	6·48	8·22	8·49	6·95	3·77	38·54

Perhaps the lesson will be more readily learned if we give these values in their relation to the tank, calling the quantity evaporated from the tank 1·00.

Relative Evaporation, April to September, 1870.

	April.	May.	June.	July.	Aug.	Sept.	Total.	If tank= 18 in. eva- porator.=
I. Howard	·51	·37	·65	·60	·89	1·56	·70	13
II. Miller	·79	·56	·65	·68	·62	·71	·66	12
IV. Tank	1·00	1·00	1·00	1·00	1·00	1·00	1·00	18
V. Earthen jar	1·19	1·14	1·41	1·62	1·61	1·19	1·40	25
VI. Tin	1·96	1·81	1·97	2·03	2·28	1·86	2·00	36
VII. „ Constant	1·63	1·62	1·87	1·99	2·25	1·70	1·88	34
VIII. Phillips' „	1·14	1·22	...	...	...	...	...	...
IX. Miller's Sand	1·16	1·24	1·26	1·26	1·53	1·30	1·29	23
X. Phillips'	1·21	1·22	1·27	1·17	1·44	1·11	1·24	22
XII. Casella (Salter) ...	2·20	2·05	2·13	2·09	2·32	2·20	2·15	39
XIII. Felt-protected ...	1·83	1·82	1·84	1·81	2·12	1·96	1·89	34
XIV. Tin	2·32	2·07	2·24	2·16	2·46	2·44	2·26	41
XV. Casella's bottle ...	2·42	2·01	2·18	2·07	2·31	2·30	2·18	39
XVI. Proctor	1·74	1·61	1·74	1·56	1·69	1·72	1·67	30
XVII. Sharpe.....	1·67	2·56	1·83	1·82	2·17	1·90	2·00	36
XIX. Fletcher	1·69	1·73	1·71	1·58	1·66	1·81	1·68	33
XXI. Roof tin.....	1·90	1·80	1·93	1·78	1·92	1·96	1·87	40

From this table it is easy to see that seven of the patterns occasionally, and three of them always, lost more than twice as much as the tank. In the last column will be seen what (supposing that the above is a fairly typical period) would be the average total yearly

evaporation by each pattern, and hence we can understand how persons have been led to state that the evaporation exceeds 30 or even 40 inches.

As already explained, Watson's Evaporator was not started until after the others, but it was going during the whole of 1872 and 1873, and gave the following results :—

EVAPORATION.						
Year.	Tank.		Watson.		Excess of Watson.	Tank = 1. Watson =
1872		17·57 in.	.....	31·25 in.	 + 13·68 in.	 1·78
1873		18·05 in.	.....	33·28 in.	 + 15·23 in.	 1·84

It thus lost nearly twice as much as the tank, because it was much smaller, and the water was heated by the exposed metal sides ; but it did not lose so much as VI., VII., XII., XIII., XIV., XV., or XVII., because it held more than twice as much water as any of them ; it held nearly two gallons.

Considering the extreme complication of the experiments, several evaporators having to be measured and recorded on quite dissimilar plans, I think that the above table bears internal evidence of the great pains bestowed upon them by Mr. Griffith—more, certainly, than some of the patterns deserved. Hints are to be picked up easily. The inutility of evaporators under shelter is shown by *Howard I.*, which in one month lost relatively more than four times as much as in another. *Miller II.* was steadier, but varied nearly from ·56 to ·79. The three low values of exposed evaporators are easily understood. *Earthen jar V.*, because the white pot did not absorb much heat, *Miller IX.* was kept cool by the wet sand, and *Phillips X.*, being of glass, absorbed little heat, and was surrounded by a gallon or two of water. On the contrary, *Tin VI.*, *Tin constant VII.*, *Casella Salted XII.*, *Tin XIV.*, and *Casella's bottle XV.*, were all of metal nearly black, and sometimes almost too hot to touch. *Fletcher XIX.* was also at times very hot, but the sides prevented the wind getting readily at the water ; hence, perhaps, its intermediate position ; and I have an impression—though it is *only* an impression—that occasionally on very hot days the water all dried up, and then evidently the evaporation must stop. It is curious that *Tin constant VII.* lost less than *Tin VI.*, because the former was purposely kept fuller, and therefore the water more exposed to wind. Perhaps the heating of the inch or two of tin in VI. had a greater effect than the increased wind over VII.

This article already contains so many tables that I omit the last

which I had prepared, and give instead particulars of what it teaches. It contained the temperature of the air and of the water in each evaporator on the hottest six days in the summer of 1870, in order to see how far it agreed with the recorded amounts of evaporation during that summer as already given. The result is remarkable :—

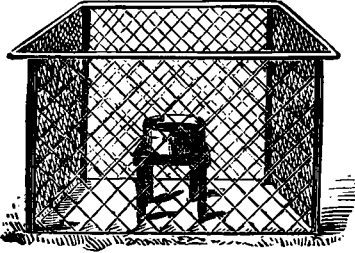
- (1). The mean temperature of the air and that of the tank agreed precisely ; each was $71^{\circ}0$.
- (2). Evaporators V., IX., X., XIII., and XVII. had mean temperatures ranging from $76^{\circ}5$ to $79^{\circ}8$, or an excess of from $4\frac{1}{2}^{\circ}$ to 9° , and their average excess of evaporation was 56 per cent.
- (3). Evaporators VI., VII., IX., XII. to XVI. and XIX. had mean temperatures ranging from $78^{\circ}7$ to $85^{\circ}7$, or an excess of from 8° to 15° , and their average excess of evaporation was 97 per cent.
- (4). The hottest three were XII., XIV., and XV., and had mean temperatures of $84^{\circ}7$ to $85^{\circ}7$, with an average excess of $14^{\circ}3$, and the average excess of evaporation was 120 per cent. In fact, they are the only three which lost more than twice as much as the tank.

Thus, finally, we see that the temperature observations thoroughly support the amount of evaporation as measured and recorded. Wretched little things, like many of these, have been, and are being, used in many parts of Europe. I hope that some of those who recommend them will do me the honour of reading this note, and either proving me wrong, or else adopting the large vessels herein advocated.

Reverting to our abstracts of notes on evaporation in *British Rainfall* and in the *Meteorological Magazine*, we have next to notice a letter on page 166 of Vol. VI. of the latter, by Dr. Hudson, and a reply thereto on p. 192, by Mr. G. Dines. The discussion is chiefly on the theoretical aspect of the subject, which, as already stated, we leave to Mr. Rogers Field, but we cannot resist the temptation to quote part of the last paragraph of Mr. Dines' letter, written, be it remembered, in 1871 :—

“ Up to the present time nothing has occurred to alter my conviction of the truth of one leading idea, namely, that if the surface temperature of water, or of any other substance, be colder than the dew point, condensation will take place ; and on the contrary, if the

surface of water, or of any other substance covered with moisture, be warmer than the dew point, evaporation will take place."



In *British Rainfall*, 1871, the only statement of importance with respect to evaporation is a table by Mr. Curtis of the amount lost by the apparatus shown in the margin, which was a can $8\frac{1}{2}$ inches in diameter, $3\frac{1}{2}$ inches deep, standing on a dwarf stool, and usually containing about 3 inches deep of water. This was observed regularly at Old Trafford, Manchester, for the 14 years 1856–69, and gave on the average the small amount of 19·24 inches.

I can explain this only as I did (on p. 36) the decreased evaporation from the tank since its removal from Strathfield Turgiss to Camden Square. London lies under a smoke cloud, and consequently the Mean Black Bulb Max. is 10° or 20° lower than in the open country. Does it not naturally follow from this that the sun will have less power to produce evaporation? In the above case there is a mean evaporation in the suburbs of Manchester of less than 20 inches from an instrument which, judged by its nearest analogue, would at Strathfield Turgiss have given nearly or quite 30 inches. And again, we have something similar with Watson's. We saw on p. 24 that the average for 39 years at Bolton was $22\frac{1}{2}$ inches; reproduced at Strathfield Turgiss, a similar instrument gave about 32 inches. Hence we get—

				Clear.	Smoke
Strathfield Turgiss, Tank	18·03 in. ...	London, Tank	.....	14·54 in.	100 80
„ Watson	 32·26 in. ...	Bolton, Watson	...	22·50 in.	100 70
„ Curtis (Estimate)	30·00 in. ...	Manchester, Curtis	19·24 in.	100	64

In the account of the Loan Scientific Exhibition at South Kensington in the *Met. Mag.*, vol. xi. (1876), pages 156 to 159 are chiefly occupied with descriptions of apparatus by Lamont, Osnaghi, Skertchley, Ebermayer, and Morgenstern, for determining the evaporation from water or from soil, but I do not think that they advance the subject sufficiently to justify their reprinting here even in abstract.

In *British Rainfall*, 1881, was given the following abstract of an article in *Ciel et Terre*. Coming from one holding so high a position as Signor Tacchini, and showing how independently he had arrived at conclusions such as I have been urging, I hope that it will not be thought waste of space to reproduce it.

“Signor Tacchini, Director of the Italian Meteorological Office, stated at the Agricultural Congress in Vienna in 1880, that M. Lesseps had informed him that the evaporation from the Suez Canal was only one-tenth of that indicated by the evaporators. Much surprise need not be felt at this fact, because the determination of the real amount of evaporation is one of the most difficult problems of meteorology, and we have not yet any apparatus capable of determining it under strictly natural conditions. The fact to be ascertained is the quantity of water which the sun carries away from the surface of rivers, lakes, and large bodies of water. The evaporators at present in use are always very small, and thereby influence considerably the fact which has to be observed, by making the water too hot and, therefore, evaporation too active.

“Experiments made with instruments of different sizes placed under identical conditions, have shown that the depth of water evaporated increases as the size of the evaporator diminishes.

“Now compare the volume of water in an evaporator 1 foot in diameter and 8 inches deep with the water in a canal 35ft. wide and 10ft. deep. The difference between the temperature of these two bodies of water must be considerable, and temperature is well known to be one of the most powerful causes of evaporation. Hence the Vienna Agricultural Conference expressed its desire to see ‘an apparatus capable of indicating exactly the evaporation from a free water surface, and from the surface of various kinds of bare and cultivated soil.’ Several members of the Conference advocated the employment of evaporators floating on the surface of large bodies of water.”

[This is an excellent illustration of the need for widely disseminating among all nations a knowledge of the work done by each. Mr. Greaves started, in 1859, an evaporator of this very kind—a box 3ft. by 3ft. and 1ft. deep—floating in a quiet part of a flowing stream. Further particulars, with engravings, will be found in the *Proc. Inst., C.E.*, vol. xlv., 1875-76.—ED.]

In *British Rainfall*, 1886, I devoted ten pages and a plate to (1) the description of the process of fixing the tank at Camden Square; (2) the modes of measurement; (3) the daily values for two years and a-half; (4) a diagram representing the monthly evaporation during that period; and (5) remarks on some of the daily values as indicative of the causes of large records either of

evaporation or condensation—for when the surface temperature is below that of the dew point condensation takes place, often to the amount of + 0·02 inch, once + 0·05 inch, and once + 0·06 inch, or rather more than one gallon of water condensed out of the atmosphere on to the surface of the tank within 24 hours. There is only one other item not already given in the present article which I think need be mentioned, viz., the angles of objects surrounding the tank. They are : S.W. office, 9° ; N.W. wall, 16° ; N.E. house, 29° ; S.E. wall, 16°.

In the *Meteorological Magazine*, vol. xxii. (1887), p. 2, is a review of the very elaborate experiments carried out by Mr. FitzGerald at the water works, Boston, U.S.A., whence he assumed that the average evaporation was 39·11 inches.

I said at the commencement of this paper that a large volume was needed to deal with the subject. I have dealt only with the Strathfield Turgiss experiments and with letters and articles upon evaporation in my own publications, and yet I have occupied as much space as can here be spared. I have dealt only with the evaporation from a water surface, not at all with that from soil or vegetation. I have scarcely (or not at all) mentioned the experiments of Dines, Evans, Greaves, Lawes, Miller, Peek, Russell, and Slade, but to do so now is impossible. I hope that I may be able to carry the account further in another volume.

**DAILY EVAPORATION AT CAMDEN SQUARE, FROM JULY, 1889,
TO JUNE, 1890.**

1889.

1890.

Date.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April.	May.	June
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
1	·14	·09	·08	·03	·01	in.	·00	+ ·02	in.	·06	·12	·17
2	·10	·08	·03	·01	·00	} ·08	·00	·03	} ·02	·06	·09	·10
3	·08	·06	·04	·00	·02	} ·08	·01	·00	} ·02	·09	·08	·05
4	·13	·03	·06	·01	·02	} ·08	+ ·04	·00	} ·02	·06	·03	·00
5	·14	·11	·04	·02	·01	+ ·01	·00	·00	·02	·05	·04	·05
6	·14	·10	·07	·01	·01	+ ·04	+ ·01	·00	+ ·01	·00	·04	·09
7	·15	·11	·02	·01	·00	} + ·06	·00	·01	+ ·03	·04	·02	·11
8	·03	·08	05 (·02)	·00	·00	} + ·06	·01	·00	·00	·09	·01	·03
9	·04	·04	·04	·02	·01	+ ·02	+ ·01	·02	·02	·04	·01	·08
10	·07	·07	·05	·01	·01	+ ·01	·02	·00	+ ·01	·02	·03	·04
11	·07	·05	·07	·02	·01	} ·00	+ ·01	·00	·01	·04	·03	·07
12	·02	·05	·05	·01	·02	} ·00	·01	·04	·00	·05	·06	·03
13	·03	·07	·10	·01	·01	·01	·00	·00	+ ·01	·06	·11	·08
14	·09	·01	·09	·02	+ ·01	·01	·00	·00	+ ·03	·08	·13	·03
15	·12	·05	·09	·00	+ ·01	+ ·09	·01	+ ·03	·01	·07	·09	·10
16	·08	·09	·08	·01	+ ·01	+ ·02	·01	·01	·01	·04	·10	·11
17	·07	·08	·05	·00	·01	+ ·01	·02	·01	·04	·00	·10	·07
18	·07	·07	·05	·01	·03	·00	+ ·02	·01	·05	·01	·05	·09
19	·06	·00	·02	·00	·01	·00	·04	·00	·01	·04	·06	·10
20	·02	·08	·07	·03	·04	·00	·01	+ ·01	·00	·04	·06	·10
21	·08	·05	·01	·04	·01	+ ·03	·00	·00	·02	·00	·10	·01
22	·08	·08	·05	·01	·00	·01	+ ·01	·02	+ ·01	·07	·10	·07
23	·08	·07	·03	·00	+ ·02	+ ·01	·02	·01	·02	·05	·14	·02
24	·02	·04	·01	·02	·02	+ ·05	·00	·01	+ ·01	·02	·16	·10
25	·05	·07	·07	·01	·03	+ ·02	·00	·01	·03	·05	·19	·11
26	·05	·07	·03	·03	·01	·01	+ ·02	·02	·04	+ ·01	·11	·03
27	·04	·03	·03	·01	·02	·01	·04	·02	·02	·06	·13	·16
28	·09	·08	·07	·00	·02	} + ·01	·00	·03	·03	·06	·07	·00
29	·06	·06	·05	·00	·02	} + ·01	·01	...	·02	·07	·08	·09
30	·04	·05	·02	·02	+ ·01	·04	+ ·01	...	·07	·13	·15	·05
31	·10	·04	...	·03	...	·00	·00	...	·05	...	·14	..
Total	2·34	1·96	1·52	·42	·29	+ ·13	·08	·19	·50	1·44	2 63	2·14

TOTAL IN EACH MONTH AND YEAR.

	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
1885.	·20	·38	·86	1·71	1·98	2·77	3·29	2·25	1·13	·77	·17	·11	15·62
1886.	·23	·13	·53	1·59	1·78	2·93	3·12	1·86	1·46	·63	·27	·12	14·65
1887.	+ ·07	·29	·76	1·72	1·79	3·68	3·76	2·54	1·25	·78	·21	·07	16·78
1888.	·07	·37	·48	1·16	2·71	2·24	1·44	1·90	1·17	·60	·43	·03	12·60
1889.	·03	·18	·62	1·07	1·76	2·97	2·34	1·96	1·52	·42	·29	+ ·13	13·03
1890.	·08	·19	·50	1·44	2·63	2·14							

MAXIMUM IN EACH MONTH AND YEAR.

	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
1885.	—	·04	·06	·12	·15	·14	·17	·14	·11	·05	·02	·04	·17
1886.	·01	·04	·08	·12	·15	·16	·22	·13	·10	·07	·04	·04	·22
1887.	·04	·05	·06	11	·14	·23	·18	·16	·08	·05	·05	·02	·23
1888.	·04	·04	·05?	·09	·17	·17	·10	·13	·09	·05	·06	·02	·17
1889.	·02	·04?	·05	·08	·13	·18	·15	·11	·10	·04	·04	·04	·18
1890.	·04	·04	·07	·13	·19	·17							

ROTHERHAM EXPERIMENTAL GAUGES.

THESE tables do not this year seem to require special comment, excepting to call attention to the enormous excess of S and R from the north, as shown by the exceptional records in the N. mouth of the five-mouthed gauge in the spring.

The distribution of R along the bank is even more accordant than usual; there is nothing which requires any important modification of the diagram given last year, which therefore may be accepted as sufficiently near the truth for all practical purposes.

RAIN GAUGE EXPERIMENTS, ULLEY RESERVOIR, ROTHERHAM, 1889.

Lat. $53^{\circ} 22' 59''$ N. Lon. $1^{\circ} 19' 9''$ W. Altitude 184 ft.

Months.	FIVE MOUTHED GAUGE. 5 ft. above ground.					INCLINED ROTATING GAUGES. 5 ft. above ground.			
	Facing East.	Facing North.	Facing West.	Facing South.	Horizon Centre.	$22\frac{1}{2}^{\circ}$	45°	$67\frac{1}{2}^{\circ}$	90°
January	·347	2·475	·279	·662	1·338	1·509	1·913	1·870	1·718
February.....	·559	6·845	1·510	·215	·684	1·422	2·626	3·698	3·369
March	1·218	5·910	1·093	1·866	3·117	4·903	5·485	5·409	4·811
April	1·544	4·351	·477	·617	2·847	3·902	4·846	4·511	3·729
May	·360	2·197	1·025	·763	3·950	4·861	5·220	4·501	3·265
June	·117	·153	·010	·022	·324	·415	·331	·190	·217
July	·401	·163	·241	·298	·862	1·123	1·270	1·186	·775
August	·304	·162	·619	1·101	2·531	2·731	3·140	2·264	1·541
September ...	·738	·385	·288	·280	1·579	1·731	1·873	1·628	1·319
October	1·869	1·848	·923	1·503	3·123	4·203	5·425	5·365	4·924
November ..	·090	·229	·383	·147	·406	·567	·657	·702	·676
December ...	·203	·231	·445	1·050	1·161	1·515	1·908	1·826	1·700
Year	7·750	24·949	7·293	8·524	21·922	28·882	34·694	33·150	28·044

Months.	POSITION No. 1. 1 ft. above ground.			POSITION No. 2. 5 ft. above ground.			POSITION No. 3. 5 ft. above ground.		
	Read Daily.	Read Mnthly.	Diff.	Read Daily.	Read Mnthly.	Diff.	Read Daily.	Read Mnthly.	Diff.
January	1·307	1·350	+·043	1·190	1·182	—·008	1·156	1·182	+·026
February	·893	·954	+·061	·567	·556	—·011	·514	·538	+·024
March	3·285	3·366	+·081	2·925	2·944	+·019	2·713	3·171	+·458
April	3·072	3·164	+·092	2·823	2·700	—·123	2·663	2·700	+·037
May	4·418	4·516	+·098	4·222	4·030	—·192	3·923	4·030	+·107
June	·438	·458	+·020	·420	·410	—·010	·399	·404	+·005
July	1·180	1·226	+·046	1·170	1·060	—·110	·852	·900	+·048
August	2·549	2·585	+·036	2·397	2·409	+·012	2·330	2·343	+·013
September ...	1·624	1·565	—·059	1·484	1·499	+·015	1·456	1·366	—·090
October	3·380	3·391	+·011	2·918	2·973	+·055	2·797	2·880	+·083
November ...	·393	·429	+·036	·327	·350	+·023	·279	·313	+·034
December ...	1·144	1·216	+·072	1·058	1·023	—·035	·998	·979	—·019
Year	23·683	24·220	+·537	21·501	21·136	—·365	20·080	20·806	+·726

Months.	POSITION No. 4. 5 ft. above ground.			POSITION No. 5. 5 ft. above ground.			POSITION No. 6. 5 ft. above ground.		
	Read Daily.	Read Mnthly.	Diff.	Read Daily.	Read Mnthly.	Diff.	Read Daily.	Read Mnthly.	Diff.
January	1·178	1·219	+·041	1·242	1·256	+·014	1·285	1·280	—·005
February	·539	·542	+·003	·578	·600	+·022	·682	·617	—·065
March	2·998	3·030	+·032	3·170	3·168	—·002	3·438	3·433	—·005
April	2·910	2·892	—·018	2·956	2·974	+·018	3·102	3·090	—·012
May	3·878	3·875	—·003	4·029	4·066	+·037	4·313	4·178	—·135
June	·394	·400	+·006	·394	·400	+·006	·422	·404	—·018
July	·929	·950	+·021	·933	·950	+·017	·961	·900	—·061
August	2·232	2·340	+·108	2·368	2·310	—·058	2·288	2·340	+·052
September ...	1·447	1·382	—·065	1·491	1·382	—·109	1·582	1·482	—·100
October	2·742	2·800	+·058	2·930	2·973	+·043	3·130	3·104	—·026
November ...	·270	·313	+·043	·288	·313	+·025	·312	·300	—·012
December ...	·980	1·009	+·029	·985	·994	+·009	1·015	·990	—·025
Year	20·497	20·752	+·255	21·364	21·386	+·022	22·530	22·118	—·412

RAINFALL AT THE ROYAL OBSERVATORY, GREENWICH.

Lat., 51° 28' 38" N.

Long., 0° 0' 0".

Communicated by W. H. M. CHRISTIE, Esq., M.A., F.R.S.,
Astronomer Royal.

1889	No. of days on which rain fell.	MONTHLY AMOUNT OF RAIN COLLECTED IN EACH GAUGE.							
		Osler's Anemometer.		On roof of Octagon Room.	On roof of Magnetic House.	On roof of Photographic Thermometer Shed.	Gauges partly sunk in the ground.		
		Self-registering Gauge.	Second Gauge.						
Height above Ground. }	...	50ft. 8in.	50ft. 8in.	38ft. 4in.	21ft. 6in.	10ft. 0in.	5in.	5in.	5in.
Height above Mean Sea Level. }	...	205ft.	205ft.	193ft.	176ft.	165ft.	155ft.	155ft.	155ft.
January	12	in. .392	in. .422	in. .634	in. .763	in. .891	in. .839	in. .912	in. .916
February.....	19	1.204	1.203	1.612	1.968	2.161	2.195	2.220	2.258
March	14	.543	.612	.843	1.090	1.285	1.317	1.316	1.345
April.....	17	1.145	1.234	1.530	1.712	1.881	1.852	1.861	1.907
May.....	15	2.450	2.533	2.992	3.134	3.253	3.299	3.294	3.295
June	6	1.134	1.221	1.542	2.039	2.090	2.067	2.067	2.049
July.....	16	1.416	1.432	1.724	2.004	2.086	2.065	2.023	2.062
August	14	1.203	1.145	1.542	1.748	1.843	1.811	1.796	1.840
September	7	1.276	1.297	1.496	1.636	1.714	1.688	1.676	1.709
October	17	3.085	3.216	3.431	3.789	4.024	3.927	3.946	3.979
November	9	.404	.402	.527	.661	.785	.781	.806	.809
December	13	.826	.795	1.145	1.182	1.372	1.437	1.466	1.471
Sums.....	159	15.078	15.512	19.018	21.726	23.385	23.278	23.383	23.640
No. of Gauge ...	...	1	2	3	4	5	6	7	8

The monthly record terminates at midnight on the last day of the month.

A rainy day is considered to be one on which 0.005 in., or more is collected in gauge No. 6.

Of the ground gauges 6, 7, and 8, No. 6 is taken as standard, No. 7 is the old monthly gauge, and No. 8 is a gauge added in 1881.

February 19, 1890.

WILLIAM ELLIS,
For the Astronomer Royal.

THE STAFF OF OBSERVERS.

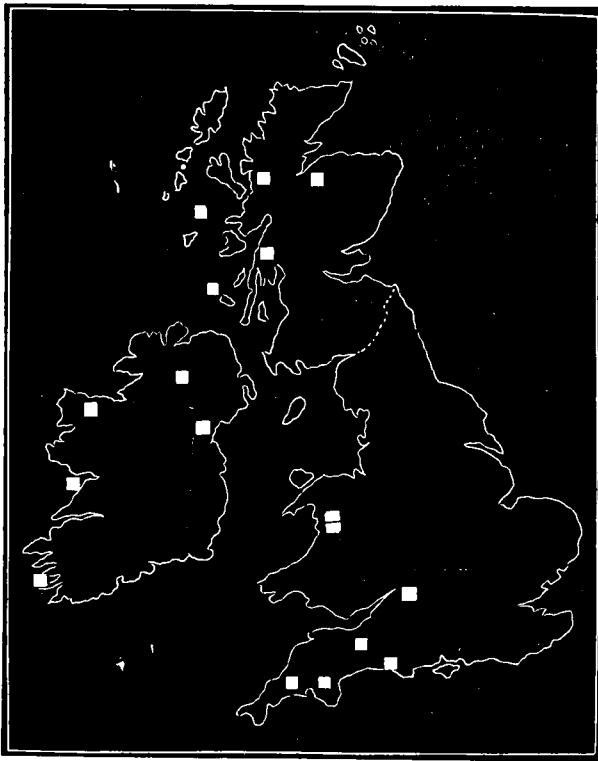
The present volume contains returns from 299 stations which sent no perfect record for 1888. That sounds like an enormous increase, and 300 new observers are not easily obtained. It has been no light task to collect all these additional helpers, and to see that they are in all respects perfectly instructed, and adhering to the rules given at the end of this volume; but of these records more than half were required to take the place of others absent either owing to the removal, illness, or death of the observer, or to accidents to the gauges or the records, as stated on subsequent pages. Our losses are 181, gains 299 or a net gain of 118. This is the largest increase since 1882, and the following table shows another important fact, viz., that Scotland, which has been retrograding ever since 1883, has at last improved considerably :—

Number of perfect rainfall records published in the volumes of British Rainfall for the undermentioned years :—

Years.	England.	Wales.	Scotland.	Ireland.	Gross Total.	Increase over previous year.
1860...	163	5	—	—	168	—
1861...	334	9	109	20	472	—
1871 .	1038	88	311	67	1504	—
1881...	1548	131	313	153	2145	31
1882...	1710	145	335	148	2338	193
1883...	1785	145	357	146	2433	95
1884...	1812	143	353	155	2463	30
1885...	1825	161	346	154	2486	23
1886...	1835	155	344	154	2488	2
1887...	1890	164	343	158	2555	67
1888...	1917	161	353	159	2590	35
1889...	2006	163	378	161	2708	118
Difference from 1888—						
Increase	89	2	25	2	118	
Decrease	—	—	—	—	—	

On endeavouring to carry out the intention expressed on page 10 I found that the result would be misleading, and therefore abandoned it. I drew a map for a considerable part of the British Isles, showing the additional stations, records for which appear now for the

first time, but they are so numerous (about 300) that it is not easy to show them clearly on a small map, and as they are not equally distributed, instead of the blank spaces on the map indicating (as they really would) the absence of *new* observers in those parts, nineteen persons out of twenty would conclude that in those districts there were no observers at all. Another difficulty is that, as already explained, I not merely discovered many persons who had been keeping a record, and therefore, could send a report for 1889, but I also induced a considerable number of persons (more than 100 others) to commence on January 1st, 1890 ; these, therefore, should go on the map as much as those who have sent 1889, but that would make the over-crowding of the map still worse. On the whole, therefore, I think that the best plan is to give the annexed little block to show



how widely scattered were the gauges supplied through Mr. Sidebottom's kindness, and to defer until next year the consideration of what is to be done towards publishing a general map of all our stations. Besides being a heavy undertaking, it will necessarily be expensive, but I think that it ought to be done.

We have not reached the 3,000 which I suggested that we ought to have before January 1st, 1890, but we cannot be far short; we have 2,708 perfect records in this volume, there are about 150 imperfect for 1889, that brings the total to 2,858, and if we put the new ones, starting on January 1st, at 120, which is about the truth, we get the gross total of 2,978—which is near enough for all practical purposes.

MIDDLESEX (57).

ABSENT RECORDS.	INSERTIONS.
Westminster (Spring Gardens) (<i>12 in. gauge</i>) <i>Record imperfect.</i>	Chelsea (Carlyle Mansions).
Upper Clapton— <i>Record ceased.</i>	„ (St. Luke's Gardens).
Uxbridge (Harefield Park)— <i>Observer dead.</i>	Kensington (Edith Road) (<i>2nd g.</i>)
Enfield (Forty Hill) (<i>3 gauges</i>)— <i>Record ceased.</i>	London (Norfolk Terrace, W.)
	„ (Canonbury).
	Perivale (Sewage Farm).
	Harrow Weald (Hill House).
	Colney Hatch (Irish Corner).

SURREY (85).

Shere (Hound House)— <i>Return not received.</i>	Haslemere (Hazlehurst).
Guildford (Guildown Obs.)— <i>Record ceased.</i>	Ewhurst Rectory.
Pirbright Vicarage— <i>Observer moved.</i>	Guildford (Piccard's Rough).
Croydon (Nantwich House) (<i>2 gauges</i>)— <i>Observer moved.</i>	Trevereux [Edenbridge].
West Norwood— <i>Observer moved.</i>	Epsom.
Virginia Water (Northlands)— <i>Record ceased.</i>	Purley (Reedham).
	Addington (Hares Bank).
	Beddington.
	Croydon (The Whitgift).
	Chertsey (Long Cross).
	New Malden Sewage Works.
	Walton-on-Thames.
	Kingston Sewage Works.

KENT (100).

Gowdhurst Vicarage— <i>No reply.</i>	Tunbridge Wells (Bredbury).
Dover (Kearsney Abbey)— <i>Record ceased.</i>	„ „ (Ferndale).
Woolwich— <i>Record imperfect.</i>	Cranbrook (Camden Lodge).
	Tunbridge (Penshurst Park).
	Shepherdswell (Hazlingdane).
	Maidstone (Linton).
	Knockholt (Kent Water Works).
	Orpington („ „)
	Sheppey (Greenborough).
	Margate (Apsley Ho.) (<i>2nd gauge</i>).
	Wilmington (Kent Water Works).
	Sydenham (Longton Grove).
	Blackheath (Westcombe Park Rd.)
	Deptford (Kent Water Works.)
	„ (Pumping Station).
	Woolwich (Powis Street).

WEST SUSSEX (29).

Angmering.
Funtington (Ratham).
Chichester (Selhurst Park).
Horsham (Manor House).
„ (Wimblehurst).
„ (Rusper Rectory).

EAST SUSSEX (55).

Beachy Head—(No. 1) <i>Gauge tampered with.</i>	Brighton (Prestonville Rd.) (2 <i>gs.</i>)
Hastings (The Hollies)— <i>Record ceased.</i>	Hastings (Beauchamp, Hollington).
Lewes (Castle Place)— <i>No reply.</i>	Hurstpierpoint (Danny Park).
Lamberhurst (Scotney Castle)— <i>Ret. unreliable.</i>	Cross-in hand (Montpellier).
Frant (Myrtle Villa)— <i>Record ceased.</i>	Balcombe (Highley Manor).
	Worth Rectory (<i>East Gauge</i>).

HAMPSHIRE (69).

Bournemouth (Tregew)— <i>Observer dead.</i>	Yarmouth (National School).
Portsmouth— <i>Record ceased.</i>	Wickham (West Lodge).
Alresford (Arle Bury)— <i>No reply.</i>	Southampton (Millbrook).
Alton (Eagles Nest)— <i>Record imperfect.</i>	Alresford (Ropley).
Rotherwick (Tydney Hall)— <i>Record imperfect.</i>	Farnborough (The Grange).
Heckfield Place— <i>Observer dead.</i>	Hartley Wintney.

BERKS (25).

Sandhurst Lodge.
Old Windsor (The Ham).
Maidenhead (Castle Hill House).

HERTS (39).

Watford (Watford House)— <i>Record unreliable.</i>	Bushey Heath.
Hemel Hempstead (Apsley Mills)— <i>G. ran over.</i>	St. Albans (Torrington House). M.
Tring (Cowroast)— <i>Gauge ran over.</i>	Hertford (Marden Hill, Tewin).
Harpenden (Rothamstead), 3rd g.— <i>G. ran over.</i>	Buntingford (Hamels Park).
Welwyn Rectory— <i>Gauge ran over.</i>	Hitchin (Fairfield).
	„ (The Maples).
	„ (Bancroft).

BUCKS (16).

Cliveden— <i>Record ceased.</i>	| Taplow Court.
---------------------------------	---------------

OXFORD (30).

Filkins [Lechlade]— <i>Record imperfect.</i>	Oxford (Rose Hill, Iffley).
Witney (Ringwood Farm)— <i>Record ceased.</i>	Banbury (Bloxham).
Banbury (Swalcliffe Park)— <i>No reply.</i>	„ (Swalcliffe Vicarage).
	„ (Ark House School).

NORTHAMPTON (37).

Chacombe House [Banbury]— <i>No reply.</i>	Grimsbury [Banbury].
Weedon (Floore)— <i>Record ceased.</i>	Northampton.
Northampton (Agnes Road)— <i>Record ceased.</i>	Thrapstone (Woodford).
Holdenby Rectory— <i>Return imperfect.</i>	Peterborough (Longthorpe).

HUNTS (6)

| Huntingdon (Brampton).

BEDFORD (24).

Bedford (Clapham Park)—*Record ceased.*

| Cardington.

| Potton.

| Bedford (The Grove).

CAMBRIDGE (28).

| Abington Pigotts [Royston].

ESSEX (37).

Southend (Avenue Road)—*Record imperfect.*Ilford (Little)—*Record imperfect.*Great Bentley (The Lodge)—*Record ceased.*

| Romford (North Ockendon).

| Upminster Hall.

| Billericay (Burghstead Lodge).

| East Mersea Rectory.

| Harlow (Moor Hall).

| Birchanger [Bishop Stortford].

SUFFOLK (36).

Nayland (Tendring Hall)—*Record ceased.*Ipswich (Woolverstone)—*Record ceased.*Bury St. Edmunds (Culford)—*Record ceased.*Weybread Vic. [Harleston]—*Record ceased.*

| Sudbury (Assington).

| Clare (Hawkedon Rectory).

| Beccles.

| Yarmouth (Belton).

NORFOLK (59).

Long Stratton (Boyland Hall)—*No reply.*Saxlingham (Nethergate)—*Record ceased.*Mulbarton—*Record imperfect.*Cromer (Northrepps)—*Record imperfect.*Cromer—*Record ceased.*Holkham (2nd gauge)—*Record imperfect.*

| Downham (Wimbotsham).

| Blofield.

| Tilney St. Lawrence (Aylmer Hall).

| North Walsham (Worstead).

| Hillington Rectory.

| Dersingham.

| Fakenham (Cranmer Hall).

WILTS (57).

Trowbridge—*Record ceased.*

| Warminster (Bugley Reformatory).

| Trowbridge (Lovemead).

| Bradford (Murhill, Winsley).

| Devizes (Wilts County Asylum).

| Calne (Compton Bassett).

| Malmesbury (The Priory).

DORSET (27).

Poole—*No observations.*

| Abbotsbury.

| Wareham (Binnegar Hall).

| Poole Road [Bournemouth].

DEVON (87).

Bolt Tail— <i>Record imperfect.</i>	Ivybridge (Langham Hill).
Brixham (Greenway)— <i>No reply.</i>	Plympton (Fursdon).
Plympton (Hemerdon)— <i>Record imperfect.</i>	Budleigh Salterton (Ravenshaw).
Paignton (Madeira Cottage)— <i>Record ceased.</i>	„ „ (Bickton).
„ (Rosenville)— <i>Record ceased.</i>	Honiton (Feniton Court).
Torquay (Strand)— <i>Record ceased.</i>	„ (Ivedon).
„ (Lamorna)— <i>Record ceased.</i>	West Buckland Rectory.
„ (Castle College)— <i>Record ceased.</i>	
Walkhampton (Meavy)— <i>No reply.</i>	
Chudleigh (Oaklands)— <i>No reply.</i>	
West Buckland (Devon Co. School)— <i>Obs. moved.</i>	

CORNWALL (34).

Helston— <i>No reply.</i>	Penzance (Trevean).
St. Austell (St. Mewan)— <i>Record ceased.</i>	Morvah (Bosporthenis).
Bodmin (Castle Street)—(3 gs.)— <i>Rec. ceased.</i>	St. Austell (Gunheath).
North Tamerton [Holsworthy].— <i>Record ceased.</i>	Launceston (South Petherwin).
	Stratton (Trelana, Poughill).

SOMERSET (53).

Temple Combe (Stowell Rec.) (2nd g.) <i>R. ceased.</i>	Yeovil (Summerlands).
Porlock (Ashley Combe)— <i>Record imperfect.</i>	Langport (Huish Episcopi).
	Dunster (Knowle).
	Minehead (Blair).
	Radstock (Downside).
	Norton St. Philip (Chatley House).
	Bath (Bathwick).
	„ (Ensleigh, Lansdowne).
	Batheaston.
	Clevedon (Channel View).
	Long Ashton Estate Office.

GLOUCESTER (60).

Bristol (Shirehampton)— <i>Observer moved.</i>	Monkswood Reservoir [Bath].
Minchinhampton (The Close)— <i>Record ceased.</i>	Clifton (Royal York Crescent).
Cheltenham (Sandford Mead)— <i>Ret. not recd.</i>	„ (Clifton College).
„ (Montpellier Lodge)— <i>Rec. ceased.</i>	„ (Pembroke Road).
	Bristol (Redland).
	Amberley (Highlands).
	Lydney (Clanna).
	Stroud (Stanley Park).
	Coleford (Newland).
	„ (Staunton Rectory).
	Bourton-on-the-Water.
	Cheltenham (Dowdeswell).

HEREFORD (25).

Brockhampton Court— <i>Observer moved.</i>	Much Marcle (Homme House).
Hereford (Fownhope Vicarage)— <i>Record imp.</i>	Hereford.
	„ (Lorraine House).

SHROPSHIRE (31).

Bridgnorth (Coton Hall).	Bridgnorth (Coton Hall).
Bishop's Castle (Totterton).	Bishop's Castle (Totterton).
Shifnal (Neachley).	Shifnal (Neachley).
Whitchurch (Green End).	Whitchurch (Green End).

STAFFORD (36).

Patshull Gardens— <i>Record imperfect.</i>	Dudley (Shavers End).
Cheadle (Oakamoor)— <i>Record imperfect.</i>	West Bromwich.
	Wolverhampton (Tettenhall).
	Hednesford.
	Uttoxeter (Brook House).

WORCESTER (32).

Little Malvern (The Farm)— <i>Record ceased.</i>	Pendock Rectory [Tewkesbury].
	Great Malvern (Belle Vue House).
	,, (Malvernbury).

WARWICK (26).

Willey Rectory [Lutterworth]— <i>Record ceased.</i>	Castle Bromwich Hall.
	Nuneaton (Wesley House).
	Sutton Coldfield.

LEICESTER (24).

Little Orton [Atherstone]— <i>Record ceased.</i>	Leicester (Humberstone Asylum).
Loughborough (Nan Panton Res.)— <i>R. not kept.</i>	Bottesford.
Melton Mowbray (Coston Rec.)— <i>Record ceased.</i>	

RUTLAND (8).

LINCOLN (64).

Spilsby (Partney)— <i>No reply.</i>	Grantham (Stainby).
Riby— <i>Record ceased.</i>	,,
Ulceby (Limber Grange)— <i>Record ceased.</i>	Kirkstead.
	Wragby (Hatton Rectory).
	Burton-on-Stather Vicarage.

NOTTS (32).

Normanton-on-Soar [Loughboro']— <i>R. ceased.</i>	Bulwell (Springfield).
Thrumpton Hall— <i>No reliable record.</i>	Tuxford (Ragnall).
Nottingham (Sherwood)— <i>Record ceased</i>	Retford (Babworth Hall).
Tuxford (Grammar School)— <i>No reply.</i>	
Worksop (Osberton)— <i>Record unreliable.</i>	

DERBY (35).

Brethby Park [Burton]— <i>Return not received.</i>	Melbourne.
,, (Geary House)— <i>No reply.</i>	Willington.
Wirksworth (Holloway)— <i>Record ceased.</i>	Derby (Midland Railway)
Chesterfield (Brimington Hall)— <i>Record imp.</i>	,, (Breadsall Lodge).

CHESHIRE (60).

Chester (Lead Works)— <i>Record ceased.</i>	Eccleston.
„ („ Field)— <i>Record ceased.</i>	Winsford (Meadow Bank).
Thelwall (Massey Hall)— <i>Record ceased.</i>	Northwich (Wincham Hall).
Altrincham (Barrington Ho.)— <i>Record ceased.</i>	Wilmslow (Southside). <i>2nd gauge.</i>
Sale (Brooklands)— <i>Record ceased.</i>	Altrincham (Dunham Lawn).
Arnfield Reservoir— <i>Return not received.</i>	Cheadle.

LANCASHIRE (147).

Woolton (Roseleigh)— <i>Record ceased.</i>	Warrington, (Howley.)
Warrington (Arpley)— <i>Gauge moved.</i>	Ormskirk (Aughton Springs) <i>New g.</i>
Manchester (Ardwick)— <i>Observer moved.</i>	Oldham (Honeywell Lane).
„ (York Place)— <i>Record ceased.</i>	Southport (Birkdale).
„ (Newton Heath)— <i>Gauge moved.</i>	Blackstone Edg. (Hollingworth Lake)
Rochdale (Stone Hill)— <i>Record ceased.</i>	Chatburn (Middlewood).
Chorley (Withnell Hall)— <i>Observer dead.</i>	Melling (Hornby Castle.)
Accrington (Warmden Res.)— <i>Record ceased.</i>	Grange (Kents Bank House).
Wray Vicarage— <i>Record unreliable.</i>	Broughton-in-Furness.
Cartmel (Flookburgh)— <i>Record ceased.</i>	Duddon Valley (Seathwaite Vic.).
	„ „ (Cockley Beck).

YORKSHIRE.

WEST RIDING (194).

Dobercross— <i>No reply.</i>	Doncaster (Wadworth Hall). <i>2 gs.</i>
Bradford (Farcliffe)— <i>Record ceased.</i>	Barnsley (Cawthorne).
Leeds (Holbeck)—(10 in. gauge)— <i>Record imp.</i>	Denshaw (Ox Hey).
Settle (Clapham)— <i>Record ceased.</i>	Meltham (Harewood Lodge). <i>Snowdn</i>
Ingleton (Halsteads) (2 gauges)— <i>Rec. unreliable</i>	Doncaster (Campsmount).
	Pontefract (Purstone Hall).
	Boston Spa.
	York (Phil. Soc. Gardens). <i>2nd g.</i>
	Harrogate (Bearer Dyke Reservoir).
	West End.
	Knaresborough.
	Pateley Bridge (Castle Stead).
	Ripon (W. W., Lumley Moor).

EAST RIDING (25).

Holme-on-the-Wolds— <i>Record ceased.</i>	Driffield (York Road). <i>2nd gauge.</i>
Thixendale— <i>Record imperfect.</i>	

NORTH RIDING (36).

Hawes (Shaw Paddock, Lunds)— <i>Gauge moved.</i>	Aysgarth (Carperby).
Catterick (Tunstall)— <i>No observations.</i>	Northallerton (Osmotherley).
Saltburn (Skelton Reservoir)— <i>Record imp.</i>	Whitby

DURHAM (33).

Thornley Vicarage— <i>Record imperfect.</i>	Eaglescliffe [Yarm].
Sunderland (W. Hendon Ho., No. 2) } <i>Return</i>	Barnard Castle.
„ („ No. 4) } <i>not recd.</i>	West Hartlepool.
„ (Fever Hospital)— <i>No reply.</i>	Tow Law.
S. Shields (Boro' Hospital)— <i>Return not received</i>	South Shields (Marsden).

NORTHUMBERLAND (46).

Newcastle (Portland Road)— <i>Record imperfect.</i>	North Shields (Monkseaton).
North Shields (Low Lights)— <i>Record ceased.</i>	Morpeth (Bothalhaugh Lawn). 2 <i>gs.</i>
„ „ (Clementhorpe)— <i>Record ceased.</i>	Redesdale (Horsley).
	Redewater (Blakehope).
	„ (Chattlehope).
	„ (Cateleugh).

CUMBERLAND (68).

Watendlath—(2 <i>gauges</i>)— <i>Record ceased.</i>	Ulpha Vic. [Broughton-in Furness]
Bassenthwaite (Mirehouse)— <i>Return not recd.</i>	Eskdale.
Brigham (Broughton Cross)— <i>Record imperfect.</i>	The Sty. <i>New S.E. gauge.</i>
Hesket Newmarket (Hutton Roof)— <i>No observ.</i>	Armboth Fells (The Pewitts).
Carlisle (Rose Hill)— <i>No reply.</i>	Helvellyn (Whiteside).
	Skiddaw Forest (Shepherd's Lodge).
	Carlisle (Scaleby).

WESTMORELAND (34).

Kendal (Underfell) (2 <i>gauges</i>)— <i>No reply.</i>	Kendal (Hill Top).
Haweswater (Mardale Green)— <i>Record ceased.</i>	„ (St. George's Vicarage).
	Windermere (Woodland Terrace).
	Asby (Town Head).
	Grisdale (Ruthwaite Lodge).
	Milburn.

WALES.

MONMOUTH (19).

Caerleon (Coldra)— <i>Record ceased.</i>	Chepstow (The Mount).
	„ (Itton Court).

GLAMORGAN (26).

Neath (Cadoxton)— <i>Return not received.</i>	Porthcawl (The Rest).
---	-----------------------

CARMARTHEN (5).

Llanelly (Old Market Place)— <i>Record imp.</i>	
Clynderwen House— <i>Record ceased.</i>	

PEMBROKE (8).

Fishguard (Castle Hill)— <i>Observer dead.</i>	Tenby (Manorbier Vicarage).
--	-----------------------------

CARDIGAN (5).

BRECKNOCK (15).

Trecastle (Llywel Vicarage)— <i>No reply.</i>	Colbren (Peneryllt).
	Cardiff (Cantref Reservoir).

RADNOR (7).

Llanstephan— <i>Record ceased.</i>	
Llandrindod Wells (Brynarlais)— <i>No reply.</i>	
New Radnor— <i>No reply.</i>	

MONTGOMERY (12).

FLINT (6).

Prestatyn (Nant)—*Record ceased.*

|

DENBIGH (18).

|	Ruabon (Belan).
|	Wrexham (Is-y-coed).
|	„ (Brymbo).
|	Ruthin (Brynmair.)

MERIONETH (7).

| Blaenau-Ffestiniog (Cefn-y-maes).

CARNARVON (12).

Pwllheli (Bodfaen)—*Record imperfect.*Pen-y-gwryd—*Record imperfect.*

| Carnarvon (North Road).

ANGLESEA (3).

ISLE OF MAN (12).

ISLES OF SCILLY (2).

JERSEY (2).

GUERNSEY (4).

| Villa Carey (2 *gauges*).

SCOTLAND.

WIGTON (6).

| Newton Stewart (Corsbie).

KIRCUDBRIGHT (10).

| Dalry (Dalshangan).

DUMFRIES (13).

Lockerbie (Castlemilk)—*Record ceased.*

|	Ruthwell (Broadgate).
|	Moffat (Craigielands).

ROXBURGH (9).

SELKIRK (2).

PEEBLES (8).

| Peebles (Kailzie).

BERWICK (6).

Berwick (Paxton House)—*Return not received.* |

HADDINGTON (6).

| Garvald (Donolly Reservoir).
| North Berwick Reservoir.

EDINBURGH (28).

Pentland Hills (Harbour Hill)—*Record imp.* | Moorfoot Hills (Bowbate).
Edinburgh—*Return not received.* | Pentland Hills (Harehill).
Dalkeith.

LINLITHGOW (4).

| Whitburn (Polkemmet).
| Bo'ness (Grange).

LANARK (13).

| Wiston School.
| Carmichael House.
| Cleghorn.
| Hamilton (Ardenclutha).

AYR (19).

Mauchline—*Observer dead.* | Ailsa Craig.

RENFREW (26).

Glenbrae—*Gauge moved.* | Goyfa Reservoir.
Shielhill.

DUMBARTON (7).

| Helensburgh (Ferniegair).

STIRLING (8).

| Strathblane (Craigend Castle).
| St. Ninian's (Woodlands).
| Buchlyvie (The Manse).

BUTE (5).

ARGYLL, MAINLAND (16).

Loch Eck (Benmore).—*No observations.* | Inveraray Castle.

ARGYLL, INSULAR. (19).

Cantire (Skipness Castle)—*Record imperfect.* | Mull (Sound of)
Coll (Acha School)—*Record imperfect.* |

CLACKMANNAN (2).

Tillicoultry—*No reply.*,, (Tillicoultry Ho.) 2nd g.—*R. ceased.*

KINROSS (2).

FIFE (11).

PERTH (29).

Menteith (Cardross)—*No reply.*| Culross (Tulliallan F. C. Manse).
| Blairingone [Dollar].

FORFAR (24).

Buddonness Lighthouse—*Return not received.*| Kirriemuir (Lednathie).
| Montrose (Waterworks) (2 gauges).

KINCARDINE (4).

ABERDEEN (18).

Aboyne Castle—*Observer moved.*Inverurie (Manar Farm)—*Record ceased.*| Cromar (Tillypronie).
| Inverurie Manse.
| Kinnairdhead.

BANFF (4).

ELGIN OR MORAY (6).

| Forres (Grange Hall).

NAIRN (2).

WEST ROSS (13).

| Lochbroom (Loch Drome).

EAST ROSS (8).

| Strathpeffer Spa.
| Dingwall H.R.S.
| Cromarty.

WEST INVERNESS (14).

EAST INVERNESS (7).

| Fort Augustus.

SUTHERLAND (10).

CAITHNESS (7).

ORKNEY (9).

| Pomona (Kirkwall).

SHETLAND (3).

IRELAND.

CORK (8).

KERRY (9).

Killarney (Gap of Dunloe)—*Gauge leaky.*Valencia Observatory—*Return not received.*

| Dingle.

| Ballyheigue.

WATERFORD (5).

Cappoquin House—*No reply.*Waterford (Newtown)—*No observations.*

TIPPERARY (6).

Nenagh (Castle Lough)—*Record imperfect.*

LIMERICK (4).

Rathkeale—*Record ceased.*

| Limerick (Roxborough).

CLARE (6).

WEXFORD (5).

Oulart (Wells)—*No reply.*

KILKENNY (5).

WICKLOW (3).

| Enniskerry (Parknasilloge).

CARLOW (2).

QUEEN'S COUNTY (1).

KING'S COUNTY (2).

KILDARE (1).

DUBLIN (10).

| Carrickmines (Claremont).

MEATH (3)

Clonee (Williamstown)— <i>Record ceased.</i>	| Athboy.
Navan (Balrath)— <i>Record imperfect.</i>	

WESTMEATH (2).

LOUTH (6).

LONGFORD (1).

GALWAY (9).

| Clifden (Kylemore Castle).

ROSCOMMON (1).

| Donamon (Castlecoote).

MAYO (5).

SLIGO (4).

LEITRIM (1).

CAVAN (2).

| Lough Sheelin (Arley).

FERMANAGH (2).

ARMAGH (3).

DOWN (12).

| Castlewellan (Lough Island).

ANTRIM (19).

Belfast (Divis mountain top)— <i>Gauge broken.</i>	| Lisburn.
Cushendall (Cushendun)— <i>Gauge moved.</i>	
	| Aghalee [Lurgan].
	| Stranocum (Gardenvale).

LONDONDERRY (8).

TYRONE (7).

DONEGAL (9).

OBITUARY.

OUR losses this year, though not numerous, are noteworthy for the very long series of observations made by many of those whom we have lost. Mr. Davis, of Orleton, heads the list in this respect with, if we are not mistaken, the longest record ever kept by one person, except the historic Lyndon register of 64 years ; Mr. Davis's record extended over 59 years. The observers whom we have lost and whose records were perfect for at least a quarter of a century were :—

59 years... Mr. Davis	33 years... Mr. Storie	28 years... Mr. Row
39 „ ... Mr. Leslie	30 „ ... Mr. Webster	25 „ ... Mr. Ainslie
„ „ ... Capt. Liddell	28 „ ... Mrs. Kaye	„ „ ... Mr. Hill
35 „ .. Mr. Tabor	„ „ .. Mr. Nutter	

Two of these, Mr. Davis and Captain Liddell, were, as is shown by the * among our original contributors to *English Rainfall*. 1860, and have contributed observations to every subsequent volume.

We have already stated how much Major Mathew helped us in North Wales ; Captain Liddell was similarly energetic and successful in Cornwall from 1855 to 1870.

OBSERVERS DECEASED TO JULY, 1889.	PERIOD OF OBSERVATION.	
	DATE.	Perfect Yearly Records.
Ainslie, D., Esq., The Gart, Callander, N.B.	C 1864 imp- 89	25
Baker, J. L., Esq., Hargrave, Kimbolton	C 1877-88 C	12
Bayne, Mr., The Gardens, Patshull, Wolverhampton	1884-89 imp	5
Bellingham, J. G., Esq., Saffron Walden	1872-89	18
Brown, A.J.D., Esq., Balloch Castle, Dumbarton, } N.B.	C 1861 imp-79, 81 imp -84 imp T ..	20
*Davis, T. H., Esq., Orleton, Tenbury, Worcester	C 1831-89 C	59
Edgar, Rev. Dr., Mauchline, Ayr, N.B.	C 1886 imp -88 T.....	2
Falls, W. S., Esq., M.D., Bournemouth	C 1862-66	5
Farrer, Rev. M. T., Ingleborough, Clapham, Yorks	1882-88 T	7
Good, H. D., Esq., C.E., Dymchurch, Kent	C 1873 imp-90 imp T	16
Gordon, J., Esq., C.E., Leicester	C 1885-88 C	4
Higgins, H., Esq., Thinghill, Hereford	C 1876 imp -89	13
Hill, J., Esq., Brithdir, Dolgelly	C 1864 -88 C	25
Hopkins, Rev. Canon, Littleport, Ely, Cambridgeshire	1879-89 T	11
Jackson, Mr. W., Market Place, Mansfield	C 1882 imp -90 imp T	7
Johnston, W., Esq., Williamstown, Clonee, Co. Meath	1872-88 T	17
Kaye, Mrs., Tetworth Hall, Huntingdonshire ...	C 1860-65 imp -88 C	28
Leslie, J., Esq., C.E., Fernielaw, Colinton, Edin- } burghshire	1849 imp -61 imp -89 ..	39
*Liddell, Capt., R.N., Bodmin, Cornwall	C 1850 -89 imp T.....	39

OBSERVERS DECEASED TO JULY, 1889.	PERIOD OF OBSERVATION.	
	DATE.	Perfect Yearly Records
Lippincott, R. C. C., Esq., Over Court, Bristol.....	1880-89	10
Little, H. J., Esq., Coldham Hall, Wisbeach....	1872-76, 78-89.....	17
Mathew, Major, Wern, Guildford, Surrey	C 1880-88 C	9
Mitchell, Miss, Shu-le-Crow Ho., Keswick.....	1877-89 C	13
Nicholl, G. W., Esq., The Ham, Cowbridge, S. Wales	C 1864 imp -88 C	24
Nicoll, Mr. J., The Cemetery, Arbroath, N.B.	C 1886 imp -90 imp...	3
Nutter, J., Esq., { Granchester Mill } Cambridge { Beech Ho.}	C 1866-88 C	23
	C 1862-89	28
Parkin, A., Esq., Sharrow Bay, Ullswater	C 1867-87 T	21
Perry, Rev. S. J., F.R.S., Stonyhurst Ob., Lancashire	1868-88 C	21
Pyle, T. T., Esq., M.D., Esplanade, Sunderland ...	C 1865-69 T	5
Row, W. N., Esq., Cove, Tiverton	C 1862-89	28
Rushmore, Mr. G. L., Tendring Hall, Stoke, Colchester	C 1867-88 T	22
Shackleton, J., Esq., Withnell Hall, Chorley.....	1875-88	14
Stocker, Rev. W. H. B., Ovington Rec, Alresford, Hants	C 1876 imp-88 C	12
Storie, Mr. J., East Linton, Haddington, N.B.....	C 1856-88	33
Sturdy, D., Esq., Trigon, Wareham, Dorset	1886-87	2
Sullivan, Adml. Sir B. J., K.C.B., Tregew, Bournemouth	1881-88 T	8
Tabor, S., Esq., Fennes, Bocking, Braintree	C 1851-86 imp T	35
Turtle, L., Esq., Aghalee, Lurgan, Ireland.....	C 1868-87	20
Varty, Mrs., Manor Road, Holloway, London	1879-87 T	9
Vawser, R. Esq. { Arpley, Warrington	1871 -77 C	7
	C 1871 imp -77 C	6
Vernon, W. F., Esq., Harefield Park, Uxbridge ...	C 1865-67 imp T, C 68	22
	imp -88	
Wathen, W. D., Esq. Castle Hill, Fishguard	1881-88 T	8
Webster, Mr. J., Gordon Castle, Banff, N.B.....	C 1860-89	30
Wildsmith, Mr., Heckfield Place, Hampshire	C 1883-88 T	6
Wood, A. H., Esq., C.E., The Hollies, Hastings, Sussex	C 1871-88 T	18

NOTE.—C indicates commencement of record and also its continuation, T its termination.
No records are quoted unless they are perfect, and copied in our MS. volumes.

RAINFALL AND METEOROLOGY
OF
1889.

SYMBOLS EMPLOYED.

H.R.S. . . . Highland Railway Station.

H. . . . Hail.

L. . . . Lightning.

R. . . . Rain, Rainfall.

S. . . . Snow.

T. . . . Thunder.

TS. . . . Thunderstorm.

TSS . . . Thunderstorms.

ON THE METEOROLOGY OF 1889.

WITH NOTES OF SOME OF THE PRINCIPAL PHENOMENA.

[These Notes should be read in conjunction with those on Heavy Rains in 1889.]

JANUARY.

1st.—*Abinger Hall* (II). Dense fog.—*Reigate, Holmfels* (II). Thick fog.

1st—3rd.—*Chelford, Astle Hall* (VIII). Thick fog all day.—*Knutsford* (VIII). Dense fog all day.

1st to 6th.—*Burton, Derby Road* (VI). Trent in flood.

2nd and 3rd.—*Elvaston* (VII). Dense fog.

2nd—7th.—*Crimplesham* (IV). Frozen rime broke down trees and telegraph wires.

3rd.—*Southwell* (VII). Very thick fog all day.

3rd—6th.—*Cheltenham* (VI). Splendid hoar frost on trees.

4th—7th.—*West Dereham* (IV). Remarkable hoar frost and rime, many large limbs of trees broken by the weight.

5th and 6th.—*Berkhampstead* (III). A singularly thick coating of hoar frost on trees, &c.—*Ketton Hall [Stamford]* (VII). Very thick rime on trees.

6th.—*Lansdowne Crescent* (I). Severe frost, with thick rime.—*Nottingham, Beeston Fields* (VII). An extraordinary thickness (an inch at least) of rime on all the trees, &c.

7th.—*Bloxham Grove* (III). Magnificent rime on trees.—*Edinburgh, Blacket Place* (XIII). Dense fog.

8th.—*Miltown Malbay* (XX). Strong southerly gale.

9th.—*Diglis Lock* (VI). Heavy southerly gale.

10th—12th.—*Colchester, Surrey Villa* (IV). S yielding 0·60 in.

12th.—*Finchley, Etchingham Park* (I). S.—*Pinner Hill* (I). S 1 in. deep.—*Berkhampstead* (III). S 1 in. deep.—*Melrose* (XII). Eildons white with S.

17th.—*Shap, Copy Hill* (X). Strong gale.

21st.—*Northampton* (III). Dense fog.

23rd.—*Ashburton, Druid* (V). Thick fog in valley.

29th.—*Leysdown* (II). S.S.W. gale all night and next morning.

30th and 31st.—*Llanfrechfa Grange* (XI). S.W. gale.

FEBRUARY.

1st.—*Douglas, Victoria Road* (XI). N.W. gale, S and H.—*New Galloway, Glenlee* (XII). T and L.—*Broadford, Hurdlestown* (XX). Severe N.W. gale, with R and S.

1st and 2nd.—*Wakefield Prison* (IX). L.

1st to 3rd.—*Miltown Malbay* (XX). Gale for 48 hours, with heavy seas.

2nd.—*Finchley, Etchingham Park* (I). L.—*Berkhampstead* (III). S 3 inches deep. Gale from W.S.W.—*Diss* (IV). Gale all day, with H and S.—*Teignmouth, Woodway* (V). At noon Oar Stone Rock, and the sea off Hope's Nose were visible from the upper windows above the trees, by which they are usually hidden. At 1 p.m. the rock was again hidden. It must have been raised by mirage about 30 ft. H and sleet showers fell about 1 p.m.—*Kempsford, Reevey* (VI). S yielding .26 in.—*Elvaston* (VII). Heavy W. gale, S storms and L.—*Chelford, Astle Hall* (VIII). S storm; heavy TS, and gale from W.—*Knutsford* (VIII). TS at 8 p.m. S all day and night, .27 in.—*Macclesfield* (VIII). T and vivid L.—*Llanwrtyd Wells* (XI). Terrific wind, with H, R and S.—*Edinburgh, Blacket Place* (XIII). S.—*Dalnaspidal* (XVI). Gale and S.—*Watten H.R.S.* (XIX). Violent N.W. gale, with T, L, R and H.—*Cloneevin* (XXI). S fell, yielding .19 in., but lay only a few hours.

3rd.—*Elvaston* (VII). Severe N.W. to N.E. gale.—*Arbroath Cemetery* (XVI). Strong gale with sleet.

—6th.—*Stronvar* (XVI). S 2 inches deep.

8th.—*Lansdowne Crescent* (I). Violent S.W. to N.W. gale.—*Diss* (IV). Heavy S.W. gale, with H and R.—*Elvaston* (VII). Heavy S.W. to N.W. gale and L.—*Rochdale, Fieldhead* (VIII). In two minutes .09 in. of R fell.—*Scarborough* (IX). Hurricane, with TS, 9 to 10 p.m.—*Barnard Castle, Whorlton* (X). N.E. gale, L in the evening.—*Melrose, Abbey Gate* (XII). Gale from W., and 2 inches of S.—*New Galloway, Glenlee* (XII). R, H, S and L.—*Edinburgh, Blacket Place* (XIII). Very heavy S (.19 in.) between 5.20 and 6.20 p.m.—*Glasgow, Queen's Park* (XIV). High wind and S drifts.—*Oban, The Corran* (XV). N.W. gale and S. A regular blizzard. *Stronvar* (XVI). S four inches deep; L in evening.—*Drumnadrochit* (XVIII). Great gale from N.W., with S storms.—*Inverness H.R.S.* (XVIII). Four inches of S.—*Nenagh, Castle Lough* (XX). Heavy fall of S at night.

8th and 9th.—*Pool Quay* (XI). Great fall of S, followed on 14th

by a large flood on the Severn.—*Douglas, Victoria Road* (XI). N.W. gale.—*Forres H.R.S.* (XVII). Gale and S storms, the line being blocked between Forres and Perth for about 18 hours, and several miles of telegraph line between Forres and Inverness broken down.—*Watten H.R.S.* (XIX). Heavy N. gale, with S and drifts.

8th to 11th.—*Crewkerne, Bincombe House* (V). Westerly gales, with S.

9th.—*Diss* (IV). Very heavy gale from W.—*Knockaderry* (XX). S yielding .33 in.—*Waterford, Ticor* (XX). S yielding .25 in.—*Galway, Queen's College* (XXII). Four inches of S at night.

9th and 10th.—*Derry Castle* (XX). Bitterly cold, with strong wind and blinding S.

10th.—*Bayswater* (I). Heavy fall of S, average depth 6 in., yield .67 in.—*Lansdowne Crescent* (I). S throughout afternoon, 6½ in. deep at 9 a.m. on 11th, yielding .64 in.—*Canonbury* (I). S storm, yielding .52 in.—*Enfield, Forty Hill* (I). S averaging 1 ft. in depth, yielded only .50 in.—*Finchley, Etchingham Park* (I). S 6 in. deep, yielding .62 in.—*Muswell Hill* (I). S yielding .62 in.—*Pinner Hill* (I). R .55 in., and 7 in. of S, yielding .58 in.—*Abinger Hall* (II). Heavy fall of S, yielding .65 in.—*Alton, Ashdell* (II). S 8 inches deep.—*Beckenham, Foxgrove* (II). S 5½ in. deep, yielded exactly .50 in.—*Dover* (II). Six-and-a-half inches of S.—*Maresfield, Forest Lodge* (II). Heavy fall of S, yielding .59 in.—*Tenterden* (II). Heavy fall of S, .64 in.—*Ryde, Thornbrough* (II). S yielding .49 in.—*Addington* (III). S began to fall about 11 a.m., and by 9 a.m. on the 11th, was a little more than 6 in. deep, yielding .59 in.—*Banbury, Bloxham* (III). Snowing all day, depth 6 inches, yielding .74 in.—*Oxford, Magdalen College* (III). About 10.30 a.m. S began to fall, at first lightly, but afterwards steadily and thickly, and it was still falling early on the 11th. At 10 a.m. it had ceased, and sixteen careful measurements gave an average depth of 5.59 in., and four measurements by melting gave an average yield of exactly .50 in.—*Northampton* (III). Deep S, yielding .28 in.—*Diss* (IV). Heavy S in afternoon, .40 in.—*Alderbury* (V). Heavy fall of S, .52 in.—*Stonehouse, Saul Lodge* (VI). Very fine S, only 3½ to 4 in. deep, but yielding .52 in.—*Cheltenham* (VI). S all day, .43 in.—*Ross, The Graig* (VI). S 6½ in. deep, yielding .64 in.—*Burton, Derby Road* (VI). S from 11 a.m. to 9 a.m. on the 11th; depth 9 inches, yield .72 in. *Diglis Lock* (VI). Heavy fall of S, .40 in.—*Ketton Hall* (VII). S after 2 p.m., 5 inches deep at 10 p.m. (yielding .26 in.) and 9 in. deep by the following day.—*Southwell* (VII).

§ 11.30 a.m. to 9 p.m., and again at night, 8 in. deep, yielding .36 in.—*Elvaston* (VII). Very heavy §, .70 in.—*Bostock Hall* (VIII). Eight inches of §.—*Chelford, Astle Hall* (VIII). § all day.—*Chepstow, Shirenewton* (XI). § $4\frac{1}{4}$ in. deep, yielding .41 in.—*Llanfrechfa Grange* (XI). § about 4 in. deep.—*Nantgwillt* (XI). § turning to R, and § again later, 1.32 in.—*Broadford, Hurdlestown* (XX). § 4 in. deep.—*Cloneevin* (XXI). § fell heavily from 8 a.m. to 5 p.m., .89 in.—*Buncrana, Rockfort* (XXIII). Heavy §, .41 in.—*Raphoe, Convoy House* (XXIII). § 6 in. deep.—*Seaforde* (XXIII). § yielding .44 in.—*Warrenpoint* (XXIII). Six inches of §.

11th.—*Canterbury, Harbledown* (II). § 6 in. to 7 in. deep.—*Sheppey, Leysdown* (II). § 3 in. deep.—*Berkhampstead* (III). § 6 in. deep.—*Diss* (IV). Heavy § in afternoon, .48 in.—*Nottingham, Beeston Fields* (VII). Nine inches of §.—*Melrose, Abbey Gate* (XII). § 6 in. deep.—*Navan, Balrath* (XXI). Heavy §, .42 in.

12th and 13th.—*Miltown Malbay* (XX). S.W. to N.W. gales.

13th.—*Llandovery* (XI). R 1.02 in. and heavy flood.

16th.—*Edinburgh, Blacket Place* (XIII). Heavy S.W. gale.

25th and 26th.—*Gorebridge, Middleton* (XII). Two inches of § each day.

26th.—*Inverness H.R.S.* (XVIII). Four inches of §.—*Cloneevin* (XXI). Very heavy fall of § after 11 p.m.

28th.—*Alton, Ashdell* (II). § 2 in. deep.

MARCH.

2nd.—*Sheppey, Leysdown* (II). § 2 inches deep.

3rd.—*Babbacombe* (V). § 7 in. deep, the greatest fall since January, 1881.—*Teignmouth, Woodway* (V). § all day.

4th.—*Bishops Cannings* (V). About 4 in. of §.—*Beaminster* (V). 3 in. of §.—*South Petherwin* (V). § about 11 in. deep.—*Llanfrechfa Grange* (XI). Steady fall of 9 in. of fine §.

4th and 5th.—*Endsleigh* (V). § fell to a depth of 18 inches.

5th.—*Salisbury, Alderbury* (V). § $3\frac{1}{2}$ in. deep.—*Ulpha Vic.* (VIII). Heavy §, turning to R.—*Glenlee, New Galloway* (XII). § from 7.30 a.m. to 2.30 p.m. 6 in. deep.—*Glasgow* (XIV). § 1 in. deep.

6th.—*Dumfries* (XII). Heavy R all day, followed by § and sleet during the night 1.22 in.

6th—8th.—*Cheltenham* (VI). R 3.45 in. in the 3 days.

7th and 8th.—*Bishops Lydeard* (V). Continuous fall of 3.27 in. of

R, causing great floods.—*Quedgeley House* (VI). 2·75 in. of R in the two days.—*Ross, The Graig* (VI). R 2·43 in., but no flood on the Wye.—*Hoar Cross* (VI). S and R 1·91 in.—*Coventry, Coundon* (VI). S and R 2·60 in.—*Grantham, Stainby Rectory* (VII). Heavy and continuous R, 1·65 in.—*Mansfield* (VII). S and R, yielding 2·15 in., followed by extensive floods.—*Macclesfield* (VIII). Snowing for 28 hours, with a violent E. gale; much melted as it fell, but it was 12 in. deep on the morning of the 9th. The wet S clung to the trees, and broke off many branches.—*Llanfrechfa Grange* (XI). Heavy R, 2·60 in.

7th—9th.—*Tewkesbury, Beckford* (VI). Continuous R or S for 45 consecutive hours, from 6 a.m. on 7th to 3 a.m. on 9th, 2·51 in.

8th.*—*St. John's [Devonport]* (V). Heavy R, 1·10 in., fell between 9 a.m. and 1.30 p.m.—*Burton, Derby Road* (VI). Very heavy R, 1·87 in., making 2·50 in. in three days. The Trent was in flood till the 15th, and the water just entered the town on the morning of the 9th.—*Stanley Park* (VI). R 2·00 in., followed by serious local floods.—*Old Springs* (VI). Heavy fall of S, yielding 1·21 in.—*Nottingham, Woodthorpe Grange* (VII). Excessive R, 2·25 in., followed by floods on low land.—*Elvaston* (VII). N. gale, with violent R and S, 1·51 in.—*Driffield, York Road* (IX). Gale and R, with some S, all day and night; total 1·24 in.—*Scarborough* (IX). Continuous S and R for 24 hours, 1·25 in.—*Llandovery* (XI). S all day, 0·95 in.—*Pool Quay* (XI). Heavy R, 1·69 in., followed on 9th by floods; the Belan brook burst its embankments, and a good deal of damage occurred.—*Corwen, Rhug* (XI). S all day, 1·12 in.

9th.—*Oxford, St. Giles* (III). High floods.—*Brampford, Speke* (V). Floods out in the Exe valley.—*Seathwaite Vicarage* (VIII). T, L, and H.—*Ulpha* (VIII). H showers and T.

19th.—*Berkhampstead* (III). In 6 minutes 0·07 in. of R fell.—*Drumnadrochit* (XVIII). Gale from N., with sleet and R.

19th and 20th.—*Hemingby* (VII). Gales, with R and S.—*Mansfield* (VII). R, 1·61 in., causing floods.—*Elvaston* (VII). Heavy R, 1·23 in.—*Miltown Malbay* (XX). N.E. gale; S on the Kerry mountains.

20th.—*Diss* (IV). Short but heavy TS.—*Bishops Lydeard* (V). S on the Quantocks.—*Melrose* (XII). Stormy, with S and sleet, 1·43 in.—*Edinburgh, Blacket Place* (XIII). Severe E.N.E. gale.

20th and 21st.—*Macclesfield* (VIII). N.W. and N.E. gales, with R and S.

* See also *Met. Mag.*, March, 1889, p. 20.

22nd—25th.—*Glenaladale* (XVIII). Stormy, with 4·58 in. of R in the 4 days.

23rd and 24th.—*Seathwaite Vicarage* (VIII). R, 2·86 in., causing floods.

26th.—*Ulpha* (VIII). Heavy gale from N.W.

31st.—*Horncastle, Bucknall* (VII). Heavy H at 2 p.m.—*Ketton Hall [Stamford]* (VII). T and H.—*Knutsford* (VIII). TS at 3 p.m., with H and R.

APRIL.

1st and 2nd.—*Douglas, Victoria Road* (XI). Bitter N.W. gale.—*Oban, The Corran* (XV). Strong W. gale.

1st—3rd.—*Forres H.R.S.* (XVII). H.

3rd.—*Melrose* (XII). S and sleet; Eildons white.—*The Hungingshaw* (XIII). S, covering the ground to a depth of 2 or 3 inches.

4th.—*Cheltenham* (VI). TS and H.—*Worcester, Pendock Rectory* (VI). TS.—*Whorlton* (X). T and L.

4th—13th.—*Dalnaspidal* (XVI). S daily.

5th and 6th.—*Broxbourne* (III). H.

7th.—*Edinburgh, Blacket Place* (XIII). Strong E. gale.

7th and 8th.—*Clifton, South Parade* (VI). In 48 hours, from 6 p.m. on 7th, 2·07 in. of R fell.—*Ross, The Graig* (VI). R commenced at 9 p.m. on 7th and ended at 6 p.m. on 9th, 2·68 in. falling in the 45 hours. The river Wye rose to 12½ ft. at Ross, the highest flood since May, 1886, which was 9 in. higher. The water rose very rapidly, and many sheep were drowned.—*Welshpool, Pool Quay* (XI). S and R on 7th, 0·31 in.; R on 8th, 1·69 in., with T. Severn in high flood.

7th—9th.—*Bristol, Bishopton* (VI). Continuous R, 2·19 in. Some of the low-lying suburbs inundated by overflow of the Frome.

8th.—*Crewkerne, Bincombe House* (V). Heavy TSS.—*Corwen, Rhug* (XI). Heavy R and S, 1·38 in.

8th and 9th.—*Macclesfield* (VIII). Strong E. gale.

8th—11th.—*Ludlow, Ashford* (VI). A great flood in the Teme, highest about midnight on 9th.

9th.—*Ravensdale School* (XXI). R 2·88 in., the greatest fall for at least 18 years.

10th.—*Figheldean* (V). In one hour and a half 0·78 in. of R fell.

11th.—*Bedworth Cemetery* (VI). T and H.—*Nottingham, Beeston Fields* (VII). T, L, and H in afternoon.

11th to 14th.—*Burton, Derby Road* (VI). Trent in slight flood.

12th.—*Emsworth, Redlands* (II). T, L, H, and R.—*Taunton, Lydeard House* (V). Heavy TS about Bagborough and on the Quantocks, and much R; roads quite flooded.—*Broadford, Hurdlestown* (XX). T and L.—*Derry Castle* (XX). T, L, and H.—*Miltown Malbay* (XX). S on the Kerry mountains.

20th.—*Galway, Queen's College* (XXII). Heavy squalls, with R and H.

20th—23rd.—*Miltown Malbay* (XX). H daily.

21st and 22nd.—*Hoar Cross* (VI). H.—*Abergwessin* (XI). H.—*Enniscoe* (XXII). H.

21st—23rd.—*Elvaston* (VII). Frequent T and L, with heavy showers of H and R.

22nd.—*Cheltenham* (VI). T and H.—*Further Barton* (VI). Distant T, L, and H.—*Southwell* (VII). T, with soft H, 1.30 p.m.

22nd—24th.—*Hoar Cross* (VI). T.

23rd.—*Bloxham Grove* (III). Vivid L and T.—*Diss* (IV). Sharp TS, followed by heavy H, breaking glass.—*Thixendale* (IX). TS in afternoon.—*The Hangingshaw* (XIII). Heavy H showers.—*Broadford, Hurdlestown* (XX). Severe W. gale.

23rd and 24th.—*Ketton Hall* (VII). Heavy H.—*Knutsford* (VIII). TSS.—*Macclesfield* (VIII). T and H.

24th.—*Wallington* (II). Slight TS.—*Berkhampstead* (III). Heavy R and H at 3 p.m.—*Bedworth Cemetery* (VI). T and H.

27th.—*Broadford, Hurdlestown* (XX). Heavy R and S at night, 1.49 in.

28th.—*Beaminster* (V). TS and H.—*Teignmouth, Woodway* (V). Heavy H shower at 4.45 p.m.—*High Harrogate* (IX). Heavy TS — *Whorlton* (X). TS.—*Melrose* (XII). T and L.—*Derry Castle* (XX). Very heavy S from 2 a.m. till 8.30 a.m.

28th and 29th.—*Stronvar* (XVI). T and H.

28th—30th.—*Douglas, Victoria Road* (XI). Easterly gales, with H at times.

29th.—*Leeds, Elmete Hall* (IX). Storm of large H.—*Barton Hall* (X). TS.—*Dalnaspidal H.R.S.* (XVI). T, L, R, and S.

29th and 30th.—*Glendrishgaig* (XIV). H.

30th.—*Berkhampstead* (III). TS from 4 to 4.30 p.m.—*Coundon* (VI). Sharp TS.—*Castle Malgwyn* (XI). T and L, with heavy showers.

MAY.

1st.—*Stronvar* (XVI). T, L and H.

1st to 3rd.—*Melrose, Abbey Gate* (XII). T and L.

2nd.—*The Hangingshaw* (XIII). TS.—*Clifden, Kylemore* (XXII). Heavy R all night, 1·97 in.

4th.—*Berkhampstead* (III). Relative humidity 40, at 3 p.m.

4th and 5th.—*Dumfries, Crichton Inst.* (XII). T and L.

4th to 7th.—*Broughton-in-Furness* (VIII). TSS daily.—*New Gallo-way, Glenlee* (XII). T daily.

5th.—*Bloxham Grove* (III). Severe TS, many buildings struck.—*Cheadle* (VI). T, L and R.—*Uttoxeter, Brook House* (VI). TS with 1·39 in. of R between 3.30 and 6.30 p.m.—*Macclesfield* (VIII). Brilliant TS.—*Elvaston* (VII). Heavy TS.—*Chelford, Astle Hall* (VIII). Violent TS, with heavy R.—*Abergwessin* (XI). TS.—*Llandovery* (XI). T, L and heavy R.—*Llanvrttyd Wells* (XI). Heavy TS.—*Douglas* (XI). Severe TS.

6th.—*Compton [Petersfield]* (II). Very heavy R, ·70 in. fell in 12½ minutes, from 3.25 p.m., and in an hour 1·55 in. fell.—*Bradford-on-Avon* (V). TS, with 1·72 in. of R, between 6 p.m. and 8·30 p.m.—*Bishops Cannings* (V). Heavy TS.—*East Budleigh* (V). TSS, with H turning to R, yielding ·75 in. between, 6·45 p.m. and 7·15 p.m., a wheelbarrow load of H stones could have been collected in one place, of the average size of playing marbles, 14 hours after the storm ceased.—*Teignmouth, Woodway* (V). TS 6 to 7 p.m.—*Wells, Westbury* (V). Heavy TS, and 1·50 in. of R, followed by floods.—*Seathwaite Vicarage* (VIII). TS, with H.—*Harrogate* (IX). TS.

7th.—*Emsworth, Redlands* (II). T, L and R, 2 p.m. to 6 p.m.—*Cadland* (II). In half-an-hour ·36 in. of R fell.—*Cheltenham* (VI). TS, with heavy R at noon, and again from 4 to 5 p.m., with a perfect deluge, quite one inch falling in the hour. The surface-water poured down the roads and flooded many streets and some houses, though the streams did not rise very high.—*Ledbury, Putley Court* (VI). Violent TS, with ·52 in. of R in an hour.—*Nottingham, Beeston Fields* (VII). T and L, 3.15 to 3.45 p.m., with ·40 of R.—*Southwell* (VII). TS, 3 to 6 p.m., ·54 in. of R.—*Buglawton Vicarage* (VIII). TS, ·43 in. of R in 25 minutes.—*Chelford, Astle Hall* (VIII). Heavy TS, with much R.—*Kirkland Vicarage* (X). TS.—*Natland Park* (X). Violent TS, two horses killed near Natland.—*Shap, Copy Hill* (X). Violent storm of T, L and H.—*The Hangingshaw* (XIII). TS.—*Oban, The*

Corran (XV). Very vivid L, T and heavy R.—*Stronvar* (XVI). T, L and R, 5.30 to 8.30 p.m.

8th.—*Oxford, St. Giles'* (III). Fine lunar rainbow at 10 p.m.

9th.—*Lansdowne Crescent* (I). TS at 4.30 p.m., .14 in. of R fell in 8 minutes.—*Muswell Hill* (I). Short storm, with T and L about 5 p.m.—*Hythe* (II). TS.—*Berkhampstead* (III). TS, 4.45 to 5.20 p.m. in 8 minutes .15 in. of R fell.—*Diss* (IV). Gale from S.E.—*Cheltenham* (VI). TS.—*Douglas* (XI). Severe TS.—*Dunkeld H.R.S.* (XVI). TS.

10th to 12th.—*Hawkedon Rectory* (IV). Heavy R, 2.69 in. in the three days, causing floods on many streams.

11th.—*Cartmel, Pit Farm* (VIII). Severe TS, with .71 in. of R; a heifer killed on Cartmel Fell.

14th.—*Ravensdale School* (XXI). Severe TS in the evening.—*Banbridge, Milltown* (XXIII). In three hours 1.12 in. of R fell.

15th.—*Stronvar* (XVI). T and L.

17th.—*Long Wittenham* (II). Between 5.15 and 5.40 p.m., 1.10 in. of R fell.—*Oxford, Magdalen College* (III) TS.—*Channel View School* (V). TS about 3 p.m., and 1.01 in. of R.—*Glastonbury, High Street* (V). Severe storm, and .89 in. of R in little more than an hour.—*Stanley Park* (VI). In two storms between 4 and 6 p.m., lasting together one hour, .92 in. of R fell.—*Further Barton* (VI). T and L.—*Ross, the Graig* (VI). Slight TS; a tree struck, and a donkey killed by L.—*Worcester, Pendock Rectory* (VI). TS.—*Llanwrtyd Wells* (XI). Vivid L, T and 1.07 in. of R.

18th.—*Rochdale, Fieldhead* (VIII). In 5 minutes .12 in. of R fell.

22nd.—*Dumfries, Crichton Inst.* (XII). T and L.

23rd.*—*Muswell Hill* (I). Much T, with L at times, between noon and 5 p.m.—*Upper Clapton, Warwick Road* (I). In less than two hours 2.65 in. of R fell.—*Finchley, Etchingham Park* (I). L and T.—*Broxbourne* (III). TS.—*Cambridge Observatory* (III). A severe TS commenced at 7 p.m.; from 8 till 9 the T and L were incessant. Hardwick Church was struck, and a laundry woman who was in the act of testing the heat of her iron by holding it near her face, lost her sight by a flash.—*Northampton* (III). T, L, and R.—*Ketton Hall* (VII). T and heavy R; .73 in. fell between 2.20 and 2.50 p.m., and 1.01 in. from 5.30 to 6.30 p.m. The river Chater rose 4 ft. in one hour; two trees in the park were struck, and Barrowden Church was much damaged by L.—*Meltham, Harewood Lodge* (IX). TS from 12.30 to

* See also *Met. Mag.*, June, 1889, p. 68.

3.15 p.m. ; no L till nearly the end of the storm, even when overhead, and then only as if the flashes were above the lowest clouds ; .26 in. of R fell in 12 minutes.—*Harrogate* (IX). TS.

23rd and 24th.—*Bucknall* (VII). Much L.—*Scarborough* (IX). TSS.

24th.*—*Cambridge Observatory* (III). Several TSS.—*Bishop's Cannings* (V). TS ; sheep killed on the downs.—*Teignmouth, Woodway* (V). TS at 3 p.m.—*Stowell Rectory* (V). TS, 7 p.m. to 8 p.m.—*Cheltenham* (VI). TS and heavy R.—*Ross, The Graig* (VI). Severe TS, 1.25 to 1.50 p.m., with H stones $2\frac{3}{8}$ in. by 2 in. in circumference.—*Bewdley, Winterdyne Gardens* (VI). In an hour .80 in. of R fell.—*Cheadle* (VI). T, L, R, and H.—*Holt Lock* (VI). Very heavy H storm.—*Hemingby* (VII). TSS in afternoon and night, and 1.48 in. of R.—*Nottingham, Beeston Fields* (VII). A furious wind from S.W. for a short time in afternoon, travelling over a narrow track, and doing great damage to trees and young vegetation.—*Mansfield* (VII). TS, accompanied by a violent whirlwind, and .47 in. of R in half an hour.—*Elvaston* (VII). Heavy TS.—*Wakefield Prison* (IX). TS ; several buildings struck by L.—*Meltham, Harewood Lodge* (IX). TS from 2 to 3 p.m.

24th and 25th.—*Rendlesham Hall* (IV). TSS.

25th.—*Surbiton* (II). R .64 in., all of which, with the exception of about .01 in., fell between 0 and 1.15 a.m. on 26th.—*Rochester, St. Mary's* (II). An exceptionally severe TS ; the R did not last much more than half an hour, but did an immense amount of damage, and the H which accompanied it broke some glass.—*Leeds, Elmete Hall* (IX). TS, with immense H stones.

26th.—*Abinger Hall* (I). R 1.93 in., falling at night in about 12 hours.—*Emsworth, Redlands* (II). In 11 hours, from 10.30 p.m., 1.89 in. of R fell.—*Guildford, Wern* (II). Steady R at night, 1.86 in.—*Long Cross* (II). Heavy TS, and 1.40 in. of R.—*Weybridge* (II). Between 9 p.m. and 9 a.m. 27th R 1.80 in.—*Stanton St. John's, Woodperry* (III). Heavy R, 1.55 in., causing a huge flood on Otmoor.

26th and 27th.—*Farnham, Bourne Vicarage* (II). In 13 hours 1.65 in. of R fell.—*Hythe* (II). TSS.—*Watford, Oaklands* (III). In less than 22 hours 2.08 in. of R fell.—*Sandy, The Lodge* (III). TSS.

27th.—*Lansdowne Crescent* (I). Very heavy R, 1.35 in. in $13\frac{1}{2}$ hours.—*Rendlesham Hall* (IV). L, T, and heavy R.—*Diss* (IV). Sharp, short TS from N., and heavy R.

* See also *Met. Mag.*, June, 1889, p. 68.

29th.*—*Berkhampstead* (III). Sharp fall of opaque H at 5 p.m. ; the leaves of many plants pierced. In 9 minutes ·13 in. of R fell.—*Northampton* (III). T, L, H, and R.—*Wells, Westbury* (V). H for about 5 minutes at 3 p.m., doing damage to crops.

29th to 31st.—*Cheadle* (VI). T and L daily.

30th.—*Bedworth Cemetery* (VI). Heavy TS, 4.15 to 5 p.m., when ·50 in. of R fell.—*Melrose, Abbey Gate* (XII). T and H.

31st.—*Knutsford* (VIII). TS, with H and R.

JUNE.

1st.—*Figheldean* (V). Sharp TS, ·57 in. of R fell in 20 minutes.—*Rochdale, Fieldhead* (VIII). TS, with ·08 in. of R in 3 minutes, and ·28 in. in 11 minutes.—*Meltham, Harewood Lodge* (IX). Three TSS, with very large H stones in the afternoon.—*Cross Fell, Kirkland* (X). Violent TS.—*Duns* (XIII). Great H storm ; stones 2 inches long, and some 7 inches in circumference.

1st to July 6th.—*Wetwang* (IX). Partial drought.

2nd.*—*Bloxham Grove* (III). Severe TS.—*Diss* (IV). Much L and distant T, slight H.—*Cheltenham* (VI). TS.—*Worcester, Pendock Rectory* (VI). TS.—*Hemingby* (VII). TS at night.—*Macclesfield* (VIII). Heavy TSS.—*Christleton Hall* (VIII). Violent TS, with R, H and large pieces of ice breaking much glass.—*Knutsford* (VIII). TSS at 7.45 a.m., and 4.30 p.m.—*Stretford* (VIII). Fearful storm of H stones three-eighths of an inch in diameter, yielding ·42 in. between 7.57 a.m., and 8.12 a.m., and again in the afternoon, ·53 in. of R fell between 4.12 p.m. and 4.30 p.m.—*Rochdale, Fieldhead* (VIII). TS, with ·31 in. of R in 11 minutes, and another TS, with ·16 in. of R and H in 3 minutes.—*Milnshaw Pleasure Grounds* (VIII). A remarkable H storm, yielding 1·62 in. ; 700 panes of glass broken.—*Duddon Hall* (VIII). Heavy TS, with 1·03 in. of R.—*Broughton-in-Furness* (VIII). Heavy TS, with 1·15 in. of R. About ·80 in. fell in half-an-hour.—*Halifax, Thorpe* (IX). Terrific H storm, lasting about five minutes. The stones were solid ice, and a quantity weighed, averaged 36 to a pound ; they measured $1\frac{1}{4}$ in. to $1\frac{3}{4}$ in. in diameter, and 1 in. thick. The larger ones weighed $\frac{3}{4}$ oz. to 1 oz. each. Ribbed glass $\frac{1}{8}$ in. thick, weighing 36 oz. per square foot was shivered, and in many cases the H stones buried themselves several inches in the ground.—*Slaidburn, Whiteholme* (IX). Heavy R (1·79 in.) and H stones

* See also *Met. Mag.*, June, 1889, p. 68.

of remarkable size. — *Settle, The Terrace* (IX). TS at 9 a.m.—*Sedbergh, Brig Flatts* (IX). Terrific TS, large pieces of ice, about the size of an old fashioned penny piece, fell ; clear ice in the centre, but white round the edge.—*Driffeld, York Road* (IX). TS at midnight.—*Eskdale* (X). Three TSS.—*Melmerby* (X). Severe TSS, R 1·43 in.—*Shap, Copy Hill* (X). Heavy TS, with 2·10 in. of R, and very vivid L.—*Rosset, Trevalyn Hall* (XI). H, consisting of very large and irregular shaped cubes of ice, which caused much destruction to green-houses.—*Crichton Inst.* (XII). T, L and R.—*New Galloway, Glenlee* (XII). T, L and heavy showers.—*North Esk Res.* (XIII). Heavy TS.—*The Hangingshaw* (XIII). Severe TS.—*Cambuslang* (XIV). TS, with ·83 in. of R.—*Glasgow, Queen's Park* (XIV). Great TS.—*Arbroath Cemetery* (XVI). T, L and heavy R, from 0.45 to 1.45 a.m.—*Dunkeld H.R.S.* (XVI). TS.—*Pittenweem, The Priory* (XVI). Heavy TS, with ·41 in. of R in 30 minutes.—*Stronvar* (XVI). T, L and R, 1 to 3 p.m., and 6.30 to 8 p.m.—*Arnhall* (XVII). Heavy TS, with 1·17 in. of R in about 45 minutes.—*Forres H.R.S.* (XVII). TS.—*Glenaladale* (XVIII). TS at 8 p.m.

2nd and 3rd.—*Dalnaspidal H.R.S.* (XVI). T and L.—*Watten* (XIX). Heavy TSS.

2nd to July 6th.—*Middleton, Chirbury* (VI). Partial drought of 35 days ; only ·22 in. of R falling on June 8th and 9th.

3rd to July 8th.—*Cambuslang* (XIV). Partial drought, 36 days, with ·11 in. of R.

3rd to July 9th.—*Edenhall Vicarage* (X). Partial drought of 36 days, with ·22 in. of R.—*Rosset, Trevalyn Hall* (XI). Partial drought, ·21 in. of R falling in 37 days.

4th to July 18th.—*Cork, Park View* (XX). Partial drought, 45 days, with ·31 in. of R.

5th and 6th.—*Melrose, Abbey Gate* (XII). T and L.

6th.*—*Bayswater, Norfolk Terrace* (I). Severe TS ; L vivid and varied, but little R.—*Finchley, Etchingham Park* (I). TS at night.—*Finsbury Park* (I). In 12 minutes ·35 in. of R fell.—*Lansdowne Crescent* (I). TS between 8 p.m. and 11 p.m. (·42 in. R) ; remarkably vivid L.—*Muswell Hill* (I). TS at night.—*Monken Hadley* (I). Heavy TS ; L almost incessant.—*Haslemere, Hazelhurst* (II). Heavy TS ; constant L for many hours ; ·53 in. of R in 1 hr. 20 min.—*Chobham* (II). Vivid L and T.—*Dover* (II). Terrific TS, with large H.—

* See also *Met. Mag.*, June, 1889, p. 68.

Arundel [Clapham] (II). TS, with .39 in. of R in less than an hour.—*Berkhampstead* (III). L in S.S.E. from 9 p.m. till 9.30 p.m., then sheet L in E. and forked L in S.S.E.; first R at 10.40 p.m., and L alternately in S.S.E. and E. about every 5 seconds, as if there were two distinct storms; T only heard occasionally after 11.15 p.m.; at 11.35 p.m. vivid L, then after 4 seconds loud crash of T; L less frequent after.—*Broxbourne* (III). TS, lasting from 6 to 11 p.m.; not much R, but incessant T and L.—*St. Albans, The Grange* (III). Terrific TS for about 2 hours, with R only during the last hour.—*Cambridge Observatory* (III). The severest TS remembered; distant T was heard from due S. at 8.30 p.m., but it was nearly 10 p.m. before it became alarming; it lasted till 1.30 a.m. on 7th; several houses were struck in Cambridge.—*Bishop's Cannings* (V). TS 9 to 12 p.m.; six cottages fired by L.—*Stowell* (V). TS at 6 a.m.—*Hemingby* (VII). TS.—*New Galloway, Glenlee* (XII). T, L, and heavy showers.—*Dumfries* (XII). Severe TS, with 1.22 in. of R.—*North Esk Res.* (XIII). Heavy TS.—*Edinburgh, Blacket Place* (XIII). Severe TS; .20 in. of R in 15 minutes.—*Pittenweem, The Priory* (XVI). Fearful L, with .94 in. of R between 9 and 10.30 p.m.—*Arbroath Cemetery* (XVI). T, L, and R from 6 p.m. to 11.30 p.m.

6th and 7th*.—*Enfield, Forty Hill* (I). Violent TSS, with very heavy R; many buildings struck.—*Wallington* (II). TSS.—*Godalming, Witley* (II). Severe TSS.—*Babbacombe* (V). TSS.

7th.†—*Tunbridge, Ferndale* (II). Violent TS, with R and H stones of extraordinary size; 2.60 in. fell, chiefly H, and the greater part in less than an hour.—*Falconhurst* (II). Violent TS.—*Margate, Renfrew Villa* (II). Severe TS in early morning, with large H.—*Ramsdale Vicarage* (II). 1.50 in. of R, which fell in an hour after a thunderstorm.—*Broxbourne, Stafford House* (III). R .76 in., the greater part between 5 and 6 p.m.—*Hamels Park* (III). Heavy TS, with 1.05 in. of R in an hour.—*Bayfordbury* (III). R 1.85 in., of which 1.65 in. fell in 45 minutes.—*Oxford, Radcliffe Observatory* (III). TS and 1.07 in. of R in less than 4 hours.—*Kettering* (III). Severe TS at 3 a.m.; two thatched cottages burnt in Kettering, apparently from globular L.—*Upminster Hall* (IV). Terrific TS.—*Ipswich, Bishop's Hill* (IV). Violent H storm between 3 and 4 a.m.; pieces of ice, $\frac{3}{4}$ in. to an inch in diameter, doing much damage to glass and vegetation.

* See also *Met. Mag.*, June, 1889, p. 68.

† See also *Met. Mag.*, June, 1889, p. 75, and July, p. 84.

Almost incessant T prevailed for 12 hours after the H storm.—*Rendlesham Hall* (IV). Terrific TS from 10.45 a.m. to 2 p.m., and from 9 to 10 p.m.; R 1.82 in.—*Diss* (IV). TS in the forenoon.—*Aylmer Hall* (IV). In 1½ hours 1.31 in. of R fell.—*Bishop's Cannings* (V). Distant T 7 to 9 a.m. and 5 to 6 p.m.—*Wyke Regis* (V). TS, with 1.82 in. of R.—*Beaminster* (V). TS.—*Ashburton, Druid House* (V). TS.—*Thixendale* (IX). TS.

9th.—*St. Michael's-on-Wyre* (VIII). .82 in. of R fell in 60 or 65 minutes.

9th to July 8th.—*Ludlow, Ashford* (VI). Drought.

9th and 10th.—*Harefield, Selling* (II). In 19 hours 2.69 in. of R fell.

10th.—*Leysdown* (II). N.E. gale and heavy R.

10th to July 6th.—*Middleton, Chirbury* (VI). Absolute drought of 27 days.

10th to July 8th.—*Quedgeley House* (VI). R fell on only 2 days (.03 in. and .01 in.), and there were 24 consecutive days without any R.—*Old Springs* (VI). Absolute drought for 29 days.—*Cowbridge, The Ham* (XI). 29 days without R.

11th to July 5th.—*Wyastone, Leys* (VI). Drought of 24 days' duration.

11th to July 8th.—*Tewkesbury, Beckford* (VI). Absolute drought of 28 days.

12th to July 2nd.—*Dumfries* (XII). No R for 21 days.

14th to July 6th.—*Kendal, Hill Top* (X). 23 consecutive days without R.

14th to July 8th.—*Rosset, Trevalyn Hall* (XI). Absolute drought for 25 days.—*Mobarnane* (XX). No R.

15th to July 5th.—*Edenhall Vicarage* (X). Absolute drought for 21 days.—*Keswick, Shu le Crow* (X). No R for 21 days.—*Cambuslang* (XIV). Absolute drought for 20 days.

16th to July 6th.—*Kenley, Ingleside* (II.) Absolute drought.—*Broomford Manor* (V). Absolute drought for 22 days.

16th to July 7th.—*Reigate, Ringley Mead* (II). 22 days without R.—*Bath, Endsleigh, Lansdowne* (V). No R.

16th to July 8th.—*Billericay* (IV). Absolute drought, and only .01 in. of R between 10th and July 8th.

18th to July 7th.—*Channel View* (V). Absolute drought for 20 days.

22nd to July 7th.—*Cork, Park View* (XX). Absolute drought for 16 days.

22nd.—*Worcester, Pendock* (VI). TS.

24th.—*Ballinrobe, Cranmore* (XXII). In 10 minutes .29 in. of R fell.

28th.—*Bloxham Grove* (III). Severe TS, .33 in. of R in half an hour.

JULY.

7th.—*Scarborough* (IX). TS at 6 p.m.

9th.—*Dover* (II). T and vivid L, with torrents of R, 1.45 in. streets flooded in a few minutes.—*Margate, Renfrew Villa* (II). TS, with heavy R.—*Ashburton, Druid* (V). Fog and torrents of R all day, 1.80 in.

9th to 11th.—*Edinburgh, Blacket Place* (XII). Continuous R for 54 hours, 2.03 in.

10th.—*Elvaston* (VII). Very heavy R, 2 to 5.30 p.m., .81 in.—*Glenlee* (XII). T, L and heavy R.—*Moniaive, Maxwellton* (XII). R 2.48 in., 1.65 in. falling between 9 a.m. and 6 p.m.

11th.—*Berkhampstead* (III). No R had penetrated 2.5 feet of soil in the percolation gauge for a fortnight.

12th.—*Twickenham, Trinity Vicarage* (I). In 20 minutes .61 in. of R fell.—*Broxbourne* (III). Heavy T, but not much R.—*St. Alban's, The Grange* (III). TS, with 2.95 in. of R, nearly all falling between 8.45 p.m. and 2.45 a.m. on 13th.—*St. Alban's, Torrington House* (III). 2.54 in. of R fell in floods at intervals, from about 9.30 to 11.30 p.m., with T and L.—*Hamels Park* (III). Heavy TS, with 2.35 in. of R in 9 hours.—*Berkhampstead* (III). TS at night. Heavy R between midnight and 2 a.m.—*Bennington Lodge* (III). TS from 4.20 to 11 p.m., and 2.51 in. of R in 11 hours.—*Hitchin* (III). TSS, with 2.10 in. of R between 5 p.m. and 5 a.m. on 13th.—*Hitchin, High Down* (III). TS, and 3.76 in. of R.—*Throcking Rectory* (III). The heaviest fall in 24 hours during 10 years, 2.60 in.—*Bloxham Grove* (III). TS at 6 p.m., with heavy R.—*Tetworth Hall* (III). A heavy TS commenced about 4 p.m., but no R fell till 6 p.m., by 7 p.m. an inch had fallen, and by 8 a.m. on 13th another 1.50 in., making 2.50 in. in 12 hours.—*Luton* (III). Between 5 and 5.20 p.m., .55 in. of R fell, and from 9 to 10.10 p.m., 3.16 in., giving a total of 3.71 in. for the day.—*Biggleswade, Langford* (III). During a TS, 1.20 in. of R fell in 1 hour 30 minutes, and the total for the 24 hours was 2.30 in.—*Sandy, The Lodge* (III). TS, and 2.06 in. of R.—*Cambridge, Hills Road* (III). Exceptionally heavy R, 3.20 in. between 6 p.m. on

12th, and 10.30 a.m. on 13th. Beyond flooded basements there was little evidence of such a heavy R having occurred, as the river was not over full.—*Bishop's Cannings* (V). T and 1.30 in. of R, most of which fell in 3 hours.—*West Bromwich* (VI). In 1 hour 15 minutes, .87 in. of R fell.—*Knutsford* (VIII). TS, and 1.50 in. of R.—*Llanwrtyd Wells* (XI). TS.

12th and 13th.—*Chatteris, The Priory* (III). In less than 24 hours, 3.44 in. of R fell.—*Stretham Ferry* (III). From 7 p.m. on 12th to 7 p.m. on 13th, 2.94 in. of R fell.—*Stretham Engine* (III). R, 1.25 in. on 12th, and 2.28 in. on 13th.

13th.—*Berkhampstead* (III). In 3 minutes, .08 in. of R fell.—*Hitchin, The Maples* (III). In 2 hours, .81 in. of R fell.—*Northampton, Hazlewood Road* (III). TS, with 1.29 in. of R.—*Sudbury, Assington* (IV). Unusually severe TS, commencing at 1 p.m., between that time and 3.10 p.m., 2.40 in. of R fell, and two cottages were struck by L.—*Norwich, Blofield* (IV). Between 11 p.m. and 9 a.m. of the 14th, 2.32 in. of R fell; the fall in 24 hours being 2.57 in.—*Teignmouth, Woodway* (V). Fair till 1 p.m., then R till 3.30 p.m., during which time 1.75 in. fell, with slight TS.—*Teignmouth, Marine Villa* (V). 1.20 in. of R fell between 1 and 3 p.m.—*Stroud, Upfield* (VI). Severe TS, with heavy R, 1.48 in. from 3.30 to 6.30 p.m., and in the 24 hours 2.38 in.—*Cheltenham* (VI). Slight R in early morning, TS at 5 p.m., from 5 to 5.20 .40 in. fell; from 6.45 to 6.55 .25 in. fell, and during the night (or early morning of the 14th), .46 in. fell. Many streets were flooded as the sewers could not carry off the surface water.—*Broomfield Vicarage* (VI). R, 2.96 in., of which 2.85 in. fell between 10 a.m. and 5.15 p.m.—*Worcester, Pendock* (VI). TS.—*Henley-in-Arden, Barrells* (VI). There fell 3.64 in. of R between 4.35 and 5.40 p.m.

14th.—*Compton Bassett* (V). In 45 minutes, .45 in. of R fell.

15th.—*Macclesfield* (VIII). T and H.—*Melrose* (XII). T and L.—*Edinburgh, Blacket Place* (XIII). TS. with heavy H, .15 in. in 11 minutes.

15th and 16th.—*Dumfries, Crichton Institution* (XII). T and L.—*Mullingar, Belvedere* (XXI). H.

16th.—*Bedworth* (VI). TS, with H; pieces of ice, some $\frac{3}{4}$ of an inch long.—*Scarborough* (IX). Heavy TS, with H at noon.—*Glenlee* (XII). T and L from 1.40 to 3.0 p.m.

17th.—*Finchley, Etchingham Park* (I). T and L between 1 and 2 p.m., and 3.30 and 5 p.m.—*Oxford, Magdalen College* (III). Heavy

TS.—*Bloxham Grove* (III). T and vivid L.—*Sandy Rectory* (III). TS, a cedar struck by L in the rectory garden.—*Sudbury* (IV). Heavy TS.—*Diss* (IV). Heavy TS in forenoon.—*Stowell Rectory* (V). TS.

20th.—*Rochdale, Fieldhead* (VIII). In 20 minutes, .58 in. of R fell.

21st.—*Lansdowne Crescent* (I). Very heavy R, .94 in. falling between 11.55 a.m. and 2.35 p.m.—*Chobham* (II). TS.—*Chelford, Astle Hall* (VIII). TS, with heavy R.—*Knutsford* (VIII). Very heavy TS at 6 p.m., and 1.05 in. of R.—*Macclesfield* (VIII). Severe TS from 5.30 to 6.30 p.m.; trees damaged, and several cows killed at Adlington.—*Wilmslow, Southside* (VIII). Violent TS, and 1.02 in. of R.—*Scarborough* (IX). TS, followed by a very wet night.

21st and 22nd.—*Douglas, Victoria Road* (XI). N.W. gale.

23rd.—*Lansdowne Crescent* (I). Heavy R and H, amounting to .58 in.—*Emsworth, Redlands* (II). Distant T, vivid L, and heavy R storms.—*Berkhampstead* (III). In 6 minutes .09 in. of R fell.—*Oxford, Magdalen College* (III). T, L, and R.—*Diss* (IV). TS in afternoon.—*Alderbury* (V). TS.—*Stowell Rectory* (V). TS.—*Nottingham, Beeston Fields* (VII). Heavy T, L, and R, 5.30 to 7 p.m.—*West Retford House* (VII). .22 in. of R in 1 hour 30 minutes.—*Elvaston* (VII). Much T and L.—*Meltham, Harewood Lodge* (IX). TS at 8 p.m.—*Scarborough* (IX). TS at 4 p.m.

24th.—*Thixendale* (IX). Heavy TS; 1.40 in. of R fell between 4.50 and 5.40 p.m.; four sheep were killed by L.

25th.—*Pawston [Coldstream]* (X). In little over 10 minutes .43 in. of R fell.—*Melrose* (XII). T and L.

26th.—*Berkhampstead* (III). T 5.30 p.m.; heavy R 5.30 to 6 p.m.—*Northampton, Hazlewood Road* (III). T, L, and R.—*Mansfield* (VII). Heavy TS; .63 in. of R in one hour.—*Elvaston* (VII). Very heavy R and T.—*Meltham, Harewood Lodge* (IX). Heavy TS from 4.30 to 7 p.m.

26th and 27th.—*Douglas, Victoria Road* (XI). N.W. gale.

27th.—*Finchley, Etchingham Park* (I). L and T.

29th.—*Chatteris, The Priory* (III). In 16 minutes .57 in. of R fell.

AUGUST.

2nd to 5th.—*Broxbourne* (III). T daily.

4th.—*Bylaugh Park* (IV). In 15 minutes, from 4.10 p.m., .60 in. of R fell.

5th.—*Berkhampstead* (III). In 6 minutes, .11 in. of R fell, and in 3 minutes, .10 in.—*Oxford, Magdalen College* (III). TS between 11 and noon.—*Southwell* (VII). TS, 12 to 1.30 p.m.—*Mansfield* (VII). Heavy TS, vivid L,—*Elvaston* (VII). Violent TSS. An oak tree struck by L, and completely barked and shattered.—*Knutsford* (VIII). Repeated TSS, with heavy R.—*Wakefield Prison* (IX). Heavy T and L. *Thixendale* (IX). TS.—*Scarborough* (IX). T, R and H.

6th.—*Holmfirth, Yateholme* (IX). In 40 minutes, from 9 a.m., .85 in. of R fell.

7th.—*Boston Spa* (IX). TS, with heavy R, .56 in. of R in 50 minutes.—*Hawes Junction* (IX). In three hours about four inches of R fell.—*Melrose, Abbey Gate* (XII). T and L.

7th and 8th.—*Selkirk, The Hangingshaw* (XIII). T.

8th.—*Coupar Angus* (XVI). TS.

9th.—*Wakefield Prison* (IX). T and L.—*Edinburgh, Blacket Place* (XIII). Heavy H shower, .12 in. in 9 minutes.—*Dunkeld H.R.S.* (XVI). Severe T at night.—*Fermoy Gas Works* (XX). T and L.—*Derry Castle* (XX). T and L.

9th and 10th.—*Miltown Malbay* (XX). T.

10th.—*Rendlesham Hall* (IV). Heavy TSS—*Diss* (IV). TS at noon.—*Bylaugh Park* (IV). TS, with 1.02 in. of R in an hour.—*Taunton, Halse* (V). About 4 p.m., .52 in. of R fell in three-quarters of an hour.—*Preston Gobalds* (VI). TS, and 1.04 in. of R.—*Ketton Hall [Stamford]* (VII). Heavy TS, 5.30 p.m.—*Douglas, Victoria Road* (XI). TS at night.

10th and 11th.—*Hoar Cross* (VI). T.

11th.—*Diss* (IV). T, and heavy R.—*Stowell Rectory* (V). TS.—*Nottingham, Beeston Fields* (VII). A waterspout said to have passed from N.W. to S.E., at 0.45 p.m., succeeded by a TS about 3 p.m. with very vivid L, and H stones as large as large peas or marbles, which lay thick on the ground for some time; .54 in. fell in about 20 minutes.—*Southwell* (VII). Several TSS in evening.—*Mansfield* (VII). T.—*Hoylake* (VIII). Between 5.50 p.m. and 6 p.m., exactly .50 in. of R fell.—*Wakefield Prison* (IX). T and L.—*Broadford, Hurdlestown* (XX). T and L.

13th and 14th.—*Broughton-in-Furness* (VIII). In 6 hours 1.76 in. of R fell.

18th and 19th.—*Kilcornan* (XX). A continuous downpour of R from 6.30 a.m. on 19th, 2.23 in.

19th.—*Derrycastle* (XX). Constant downpour all day and night,

2·65 in.—*O'Briensbridge, Ross* (XX). Remarkably heavy R, 2·48 in.—*Broadford, Hurdlestown* (XX). The heaviest fall of R in East Clare for 42 years, 1·71 in.—*Ennis* (XX). Constant R for 16 hours, 1·96 in.—*Balbriggan* (XXI). R began at 9.15 a.m., and fell incessantly till after midnight; total, 1·87 in.—*Lurgan, Belle Vue* (XXIII). The greatest R on record (1·47 in.) after 7 p.m., causing great floods.

19th to 21st.—*Emsworth, Redlands* (II). S.W. gales.

20th.—*Bylaugh Park* (IV). TS, with ·53 in. of R in 30 minutes.—*Chelford, Astle Hall* (VIII). Westerly gale and heavy R.—*Edinburgh, Blacket Place* (XIII). Very heavy R, 1·41 in. in 10 hours.

21st.—*Berkhampstead* (III). T and L in W. about 6 p.m.—*Tetworth Hall* (III). ·62 in. of R fell within 30 minutes.—*Sandy* (III). Heavy TS.—*Dernel Hill [Chepstow]* (VI). The R measured was dark coloured.—*Elvaston* (VII). Stormy, with T and L.—*Knutsford* (VIII). TS.—*Chelford, Astle Hall* (VIII). Heavy TS, with much R.—*Meltham, Harewood Lodge* (IX). T and L 4 to 5 p.m.—*Douglas, Victoria Road* (XI). TS.—*Cork* (XX). Heavy R, ·30 in. in 12 minutes.

22nd.—*Rhug, Corwen* (XI). TSS.

24th.—*Finchley, Etchingham Park* (I). Slight TS.—*Chobham* (II). TS, with H.—*Wallington* (II). TS, with H.—*Further Barton* (VI). TS.

29th and 30th.—*Teignmouth, Woodway* (V). Heavy fogs.

30th.—*Berkhampstead* (III). Relative humidity at 3 p.m., 39.

SEPTEMBER.

2nd.*—*Finchley, Etchingham Park* (I). Much distant L at night.—*Keston Tower* (II). TS, with heavy R.—*Rochester, Knight's Place* (II). Heavy TS, with 1·75 in. of R.—*Hamels Park* (III). Heavy TS, with ·54 in. of R in 2 hours.—*Billericay* (IV). Distant T and L began about 6.20 p.m.; slight R at 6.50 and heavy R at 9.40, and from 10.30 to 11 the storm was at its height, with very vivid L and T and heavy R. Total fall, 1·13 in.—*Brentwood, Dudbrook House* (IV). From early evening to break of day a TS raged without cessation, accompanied by a hurricane of wind and a deluge of R (2·13 in.), which burst open the drains and ploughed up the roads in every direction.—*North Ockenden* (IV). Storm, with 4·45 in. of R between 9 p.m. and 5.15 a.m. on 3rd.—*Upminster Hall* (IV). TS, with fearful L and 4·32 in. of R.

* See also *Met. Mag.*, September, 1889, p. 113.

3rd.—*Ilford, Great Gearies* (IV). TS at night, with 1·32 in. of R in about 3 hours.—*Hamels Park* (III). ·54 in. of R in 2 hours.

3rd to 19th.—*Wyastone Leys* (VI). Drought of 15 days' duration.

5th.—*Douglas, Victoria Road* (XI). Dense fog; steamers delayed.

12th.—*Cheltenham* (VI). Mean temp. 69°·2, the highest for any day of the year.—*Watten H.R.S.* (XIX). T and L.

18th.—*Broughton-in-Furness* (VIII). R 1·31 in. in 7 hours.

20th.—*Knutsford* (VIII). TS, with H and R.—*Driffield, York Road* (IX). L at night; very heavy H shower from 2 to 2.10 p.m., giving ·06 in. of R.—*Glendrishaig* (XIV). TS, with H and R.

21st.—*Elvaston* (VII). H, R, and L.

23rd.—*Nottingham, Beeston Fields* (VII). During the night 1·24 in. of R fell.—*Elvaston* (VII). Very heavy R, 1·06 in.

23rd and 24th.—*Stainby Rectory* (VII). Continuous heavy R for 36 hours, 1·62 in.—*Llanfrechfa Grange* (XI). Steady R from 8 p.m. on 23rd to 7 a.m. on 24th, 2·17 in.

24th.—*Lansdowne Crescent* (I). Heavy R; ·83 in. fell between noon and 5 p.m.—*Diss* (IV). Tremendous downpour of R, 1·79 in. falling between 3 a.m. and 7 p.m., with distant T and L in afternoon.

25th.—*Shap* (X). S on the ground, which soon melted, but remained on the hills all day.

OCTOBER.

4th.—*Emsworth, Redlands* (II). Between 1 a.m. and 5 a.m., 1·19 in. of R fell.

5th.—*Miltown Malbay* (XX). Very heavy gale, S.W. to N.W.

6th.—*Broadford, Hurdlestown* (XX). Severe W. gale.—*Derry Castle* (XX). Furious S.W. gale.—*Cloneevin* (XXI). Tremendous gale, S.W.; W; S.E: supposed to be the worst since the great storm of 1839.—*Lawderdale* (XXII). Hurricane from N.W.

7th.—*Diss* (IV). Heavy gale all day.—*Ketton Hall* [*Stamford*] (VII). Heavy gale.—*Chelford, Astle Hall* (VIII). Great gale from S.W., with much R, did great damage.—*Holmfirth, Yateholme* (IX). In 75 minutes from 9.10 a.m., 1·65 in. of R fell.—*Meltham, Harewood Lodge* (IX). Very severe gales from about midnight for 24 hours; very heavy gusts of wind.—*Driffield, York Road* (IX). Gale; blowing branches off several large trees.—*Douglas, Victoria Road* (XI). Exceptionally severe W.S.W. gale.

7th to 9th.—*Derry Castle* (XX). Very stormy, with R and H.

8th.—*Seathwaite Vicarage* (VIII). T, L, H and heavy R.—*Dumfries, Crichton Institution* (XII). T and L.—*New Galloway, Glenlee* (XII). T, L and heavy showers.—*Stronvar* (XVI). T and L.

10th.—*Chelford, Astle Hall* (VIII). Very heavy R in afternoon, with T and L.—*Rochdale, Fieldhead* (VIII). In $1\frac{1}{2}$ minutes, .03 in. of R fell.—*Llanfrechfa Grange* (XI). T and L.

11th.—*Stowell Rectory* (V). TS.—*Ross, The Graig* (VI). T, L and H, in 10 minutes, 3.45 to 3.55 p.m., .23 in. fell.

16th.—*Reigate, Ringley Mead* (II). In about 45 minutes, .61 in. of R fell.

18th and 19th.—*Longraigue* (XXI). In 36 hours, 2.43 in. of R fell.

19th.—*O'Briensbridge, Ross* (XX). R, 2.48 in.; the largest fall in 24 hours, during 42 years.

19th to 21st.—*Broxbourne* (III). L daily.

20th.—*Northampton, Hazlewood Road* (III). T, L and R.—*Scarborough* (IX). T and L.

21st.—*Babbacombe* (V). TS.—*Teignmouth, Woodway* (V). TS, 11 p.m. to midnight.

21st and 22nd.—*Scarborough* (IX). Heavy gale and high sea.

22nd.—*Rendlesham Hall* (IV). TSS at 9.45 p.m., and 2 and 4 a.m. on 23rd, total R, 1.18 in.

23rd.—*Colchester, Surrey Villa* (IV). In 2 hours, .87 in. of R fell.—*Diss* (IV). TS in early morn.—*Ashburton, Druid House* (V). TS.—*Babbacombe* (V). TS.

31st.—*Douglas, Victoria Road* (XI). Very severe S.W. gale.—*Broadford, Hurdlestown* (XX). Severe S.W. gale.—*Miltown Malbay* (XX). S.W. to N.W. gale, with heavy H.

NOVEMBER.

1st.—*Ashburton, Druid House* (V). Bright-coloured lunar rainbow at 10 p.m.—*Brampford, Speke* (V). Lunar rainbow.—*Meltham, Harewood Lodge* (IX). TS 3 to 4 p.m.—*Whorlton* (X). S.W. gale all day.—*Shap, Copy Hill* (X). Gale all day.—*Douglas, Victoria Road* (XI). S.W. gale and heavy sea.—*New Galloway, Glenlee* (XII). L and heavy R.—*Edinburgh, Blacket Place* (XIII). Strong gale; average velocity of wind 24 miles per hour.—*Glendrisaig* (XIV). Great gale, with R and T.—*Drumnadrochit* (XVIII). High wind and heavy R, 1.61 in.—*Cork* (XX). T, L, and heavy H.

4th to 24th.—*Bayswater, Norfolk Terrace* (I). Absolute drought.

6th, 7th, and 8th.—*Torrington, Langtree* (V). Dense fogs.

7th and 8th.—*Crimplesham* (IV). Several butterflies seen.

12th and 13th.—*Mansfield, Market Place* (VII). Thick fogs.—*Wakefield Prison* (IX). Fog, dense on 13th.

13th.—*Northampton, Hazlewood Road* (III). Dense fog.—*Ketton Hall* (VII). Thick fog, yielding .01 in. in gauge.—*Edinburgh, Blacket Place* (XIII). Thick fog.

14th.—*Finchley, Etchingham Park* (I). Thick fog all day.

16th.—*Worcester, Pendock* (VI). From 5 to 6 p.m. a peculiar thick, dark fog, causing great darkness; wind N.N.W.—*Nottingham, Beeston Fields* (VII). So dark at 2.15 p.m. that artificial light had to be resorted to.

24th.—*Emsworth, Redlands* (II). S.W. gale at night.—*Rendlesham Hall* (IV). S. to S.W. gale.—*Seathwaite Vicarage* (VIII). Thick fog.—*Eskdale Vicarage* (X). Severe storm of S.—*Broadford, Hurdlestown* (XX). Heavy R; .50 in. in a few hours, causing severe floods.—*Miltown Malbay* (XX). In 2 hours .75 in. of R fell.

24th to 26th.—*Drumnadrochit* (XVIII). About 5 in. of S fell.

25th.—*Hazlebury Bryan* (V). Strong gale.—*Glendrishaig* (XIV). S showers.

25th and 26th.—*Mansfield, Market Place* (VII). S storms.—*Elvaston* (VII). Driving S storms and H.—*Broughton-in-Furness* (VIII). S.—*Wakefield Prison* (IX). S storms.—*Borrowdale Vicarage* (X). Melted S.—*Ulpha Vicarage* (X). S fell heavily.

25th to 27th.—*Glenaladale* (XVIII). S.

26th.—*Ashburton, Druid House* (V). Heavy S in night.—*Bedworth Cemetery* (VI). S.—*Seathwaite Vicarage* (VIII). S.—*Scarborough* (IX). Storm of S and H.—*Llandovery* (XI). Heavy fall of S.—*Watten H.R.S.* (XIX). About 4 in. of S, much drifted.—*Broadford, Hurdlestown* (XX). S 1½ in. deep; drifts on the hills reported to be 6 feet deep.—*Galway, Queen's College* (XXII). About 3 in. of S.—*Cushendall, Cushendun* (XXIII). Heavy fall of S.

26th and 27th.—*Horncastle, Hemingby* (VII). Gale, with S.—*Castle Malgwyn* (XI). S.—*Penty Park* (XI). S.—*Miltown Malbay* (XX). S.—*Markree Observatory* (XXII). Ground covered with S.

26th to 28th.—*Diss* (IV). Heavy S daily.

27th.—*Finchley, Etchingham Park* (I). S sufficient to cover the ground.—*Lower Walmer* (II). Heavy fall of S; very vivid L at night.—*Sheppey, Leysdown* (II). An inch of S.—*Berkhampstead* (III). S half an inch deep.—*Ipswich, Bishop's Hill* (IV). S and sleet all day.

—*Driffild, York Road* (IX). Drifting S; 6 inches yielded .59 in.—*Scarborough* (IX). S storm, with heavy T and L at 11 a.m.

27th and 28th.—*Drinkstone Park* (IV). S, yielding .75 in.

29th.—*Meltham, Harewood Lodge* (IX). TS from 4 to 5 p.m.

DECEMBER.

5th and 6th.—*Abergwessin Vicarage* (XI). S.

6th.—*Bloxham Grove* (III). S at night, 5 or 6 in. deep on the level.—*Bishop's Cannings* (V). S, 5 in. deep at 9 a.m. on 7th.—*Wells, Westbury* (V). S and sleet, .39 in.—*Llanfrechfa Grange* (XI). S at night, an inch deep.

6th and 7th.—*Broxbourne* (III). S.—*Oxford, Magdalen College* (III). S.—*Alconbury* (III). S.—*Southend* (IV). S.—*Woodford, The Harts* (IV). S.—*Ketton Hall [Stamford]* (VII). S.—*Hemingby* (VII). S.

7th.—*Lansdowne Crescent* (I). S, $1\frac{1}{2}$ in. deep at noon, yielding .23 in.—*Finchley, Etchingham Park* (I). S on ground, $1\frac{1}{2}$ in. deep at 9 a.m.—*Berkhampstead* (III). S $2\frac{1}{2}$ in. deep.—*Diss* (IV). S nearly all day.—*Southwell* (VII). S in night, $2\frac{1}{2}$ in. deep, yielding .43 in.—*Elvaston* (VII). Heavy S.—*Chepstow, Shirenewton* (XI). S $3\frac{1}{2}$ in. deep, yielding .41 in.

10th.—*Melrose, Abbey Gate* (XII). S on the Eildon hills.—*Watten H.R.S.* (XIX). N.W. gale, with R, sleet and S.

11th.—*Ashburton, Druid House* (V). Hills white with S.

13th.—*Diss* (IV). Gale from S.—*Hull, Derringham* (IX). For three hours in the evening, the densest fog remembered.

13th to 16th.—*Wakefield Prison* (IX). Dense fogs.

14th to 18th.—*Finchley, Etchingham Park* (1). Wet mists.—*Broxbourne* (III). Fog.

15th to 18th.—*Emsworth, Redlands* (II). Wet fog.

17th to 20th.—*Glenaladale* (XVIII). S on the hills.

19th.—*Berkhampstead* (III). Thick fog, garden wall 10 yards distant invisible at 9 a.m.

30th.—*Berkhampstead* (III). Thick fog, garden wall invisible at a distance of 11 yards, during afternoon.

31st.—*Bloxham Grove* (III). Dense fog.

OBSERVERS' NOTES ON THE MONTHS OF 1889.

JANUARY.

I. *Lansdowne Crescent*. The smallest R in January since 1880 ($\cdot 82$ in.). Frost in shade on 11 nights.—*Muswell Hill*. Driest January since 1880. R only two-fifths of the average of 17 years.

II. *Abinger Hall*. An unusual amount of fog; otherwise an open and genial, though rather sunless, month.—*Wallington*. Very dull and damp, without snow, and towards the end of the month vegetation began to sprout. Mean temp, $1^{\circ}0$ above the average; slight S on 3 days.—*Keston Tower*. A month remarkable for calms and light wind; a good deal of fog; very little R; a few days' skating in the first week, and a little snow in the second, but temp. above the average.—*Littlehampton*. R unusually small. Frost on 6th and 7th killed everything in flower-gardens; thrushes and larks singing daily.—*Emsworth, Redlands*. First week dry and cold, with hard frost; the remainder foggy, muggy, and unseasonably mild.

III. *Bloxham Grove*. The month opened with a week of frost, on some days very severe; it was then gloomy, with fog; and from 21st to 29th fine and mild.—*Northampton, Hazlewood Road*. Mild and frosty by turns; R $1\cdot 24$ in. below the average.

IV. *Harlow, Sheering*. R $1\cdot 50$ in. less than the average of 20 years.—*Ipswich, Bishops Hill*. The driest January since 1880. R $1\cdot 22$ in. less than the average. Many white frosts, and an unusual amount of mist and thick fog, with mild weather. Skating on 6th, 7th, and 8th.—*Woodbridge*. A good deal of fog and white frost.—*Diss*. The month opened with frost, and skating on the 6th and 7th; slight S fell on the 11th and 12th, and the next four days were magnificent. From the 17th to the end of the month was mild and calm, with some brilliant days and light rains. R $\cdot 81$ in. below the average, water becoming scarce at the end of the month.

V. *Bishops Cannings*. A warm month, especially at the end; very little R, the fall being $1\cdot 50$ in. below the average.—*Babbacombe*. A

month of average temp. and cloudiness, with high bar., very little R, but damper and calmer than usual. R the smallest registered in January. Birds singing and flowers in bloom throughout the month.—*Stowell Rectory*. The first part cold, the latter part warm, the temp. rising to $51^{\circ}7$ on 31st.

VI. *Cirencester, Further Barton*. First week cold, with freezing fog for three days, producing ice crystals of unusual extent, so that it was difficult to believe the trees were not covered with S. One of the sheaves of spiculæ measured nearly $2\frac{1}{2}$ inches in length. After the 7th the weather became changeable, cloudy and damp, though very little R fell. Thrushes singing all day at end of the month.—*Ross, The Graig*. Seasonable, without great extremes. From the 2nd to 6th the temp. was below freezing point day and night, and until the last three days, hardly any were warm.

VII. *Ketton Hall [Stamford]*. A dry month, only 3 days of heavy R; very little sun and much fog; very thick rime on trees on 5th and 6th; severe frost up to 9th; a little sun on 10th and 12th.—*Horncastle, Bucknall*. Severe frost during the first week, but very little after. Only one day (12th) on which S fell.—*Hodsock Priory*. A dull calm month, rather cold and dry, with a high bar.; a week's frost at the beginning, the rest of the month open.—*Mansfield*. Severe frost during the first week, then dull and foggy to the 20th, followed by a week of fairly bright weather, and then dull and mild to the close, with high wind on the 29th and 31st.—*Elvaston*. A quiet month; frosty during the first few days; stormy towards the end; 12 frosty nights.

VIII. *Hinderton*. The driest January on record, except 1881.—*Seathwaite Vicarage*. An exceptionally mild January, with but one day's light S, and 6 days' frost.

IX. *Hull, Derringham*. Dense fogs, with rime, during the first 8 days, and absence of sunshine till the 19th, then mild and sunny.—*Driffeld, York Road*. The first half foggy and cloudy, with only 6 hours 20 mins. sunshine up to the 16th. The remainder much brighter.—*Scarborough*. Very mild and open, but little frost, and not a flake of S. Many brilliant days, and no very high wind.—*East Layton Hall*. Very fine and open, with many beautiful sunsets.

X. *Haltwhistle, Unthank*. Unusually fine, open weather during the whole month.—*Ulpha*. With the exception of the last four days, the month was remarkable for freedom both from R and frost. Some days were dark, but many were very sunny, and there was an absence of

storms until the last few days, when rough weather set in.—*Uldale Rectory*. Extremely mild and open throughout, with an almost total absence of storms of wind.—*Shap, Copy Hill*. The first half dry and cold, with heavy fogs at times; the 22nd and 25th were very warm, and it was cold again at end of month.

XI. *Disserth, Glanhewey*. The first week cold, with 4 days' skating; then generally fine and warm till the last week, which was wet.—*Douglas, Victoria Road*. Fine and open, with temp. for the most part in excess of the average, more especially during the last week. Birds singing throughout, and crocus in flower on 23rd.

XII. *Melrose, Abbey Gate*. Exceedingly mild, caused, no doubt, by the wind blowing from southerly or westerly points on 25 days; R 1·86 in. below the average.

XVI. *Stronvar*. Very changeable, but on the whole most exceptionally mild; prevalent winds westerly; bar. very unsteady.—*Coupar Angus*. With the exception of the first 3 nights, there was very little frost, and the temp. was above the average; R 1·31 in. below the average of 7 years.—*Dunkeld H.R.S.* Almost unprecedentedly mild throughout.—*Arbroath Cemetery*. Generally dull, with a few bright days; mean temp. 2°·3 above the average; R 1·40 in. below the average; prevailing wind S.W.

XVIII. *Drumnadrochit*. So mild that ploughing was not interrupted for a single day; no S at this level, and but little on the heights. Such weather in January has not been experienced by the present generation.—*Glenaladale*. Generally beautiful, calm, and mild, but the last few days wet and stormy.

XIX. *Watten H.R.S.* Fresh and open, with storms of wind and R and H in the latter half. A marked absence of S and frost.—*Swanbister*. Unusually mild; vegetation exceptionally advanced.

XX. *Coolkelure*. Singularly mild, but a good deal of rough wind, which seems to be usually the case in winter when frosts and S are absent.—*Derry Castle*. Sharp frost and much fog during the first half, but from the 19th to the close exceptionally mild; fields green, and birds singing. Dense fogs again from 20th to 25th; R slightly below the average.—*Castle Lough*. Mild and damp, scarcely any frost.—*Miltown Malbay*. The mildest and moistest January within recollection. No ice more than the twelfth of an inch thick, and only a few S flakes in one shower.

XXIII. *Belfast, New Barnsley*. Fine and open, more like March than January. Birds singing, flowers blooming, and vegetation starting like early spring.

FEBRUARY.

I. *Lansdowne Crescent*. Very cold ; frost in shade on 19 nights. The four days 10th to 13th had a mean temp. of only $29^{\circ}1$.—*Muswell Hill*. R about 12 per cent. above the average ; S falling more often than R, and by far the greater part in the first 16 days.—*Finchley, Etchingham Park*. Rather wet, four-fifths of the total falling in the first 14 days.

II. *Abinger Hall*. Cold, changeable, and snowy, just what was needed.—*Wallington*. Rather cold and dreary, though with occasional warm days. R $\cdot 18$ in. above the average ; humidity 88 ; amount of cloud $7\cdot 2$; mean temp. $37^{\circ}2$. The sun did not shine on 6 days.—*Hythe*. Severe and wintry, with S on the ground nearly all the month, but no great depth.—*Keston Tower*. On the whole cold, especially the last week.—*Emsworth, Redlands*. Dull and gloomy, with strong N.E. winds and frost nearly every night.

III. *Banbury, Bloxham*. With the exception of 4 days the temp. was low, with frequent S storms, and a heavy fall on 10th. Great absence of sunshine. Prevailing winds N.W. and N.E.—*Northampton*. R $\cdot 92$ in. above the average of 23 years. S fell on 10 days, mostly slight, except on 10th.

IV. *Harlow, Sheering*. R almost exactly the average of 20 years.—*Sudbury*. Very cold and frosty throughout, with much S.—*Ipswich, Bishop's Hill*. R $\cdot 52$ in. above the average. A good deal of S, but heavy only on 10th and 11th. Temp. generally low, with considerable variations.—*Woodbridge, Melton*. Constant S, generally melting as it fell, except on 10th and 11th.—*Diss*. A month of real winter weather. S fell on 15 days, heavily on 10th and 11th. There were gales from the S. and W. on the 1st and 2nd, and very severe gales, also from S. and W., on the 8th and 9th. S and H fell daily, but in small quantities, from the 21st to the close.

V. *Bishop's Cannings*. R $\cdot 60$ in. below the average. Frequent slight falls of S.—*Babbacombe*. A cold, dry (as to R and humidity), but showery month, with great and sudden variations of temp. The max. temp. ($58^{\circ}6$) was the highest ever observed in February. L on 2nd and 3rd ; S on 11 days ; H on 7 days.—*South Molton, Rose Ash*. Generally very mild, and sometimes very wet, till the last week, when S fell in small quantities, and the weather was very cold.

VI. *Ross, The Graig*. On the whole seasonable, though the changes of temp. and pressure were great and sudden. R, mostly as S, rather more than half the average. The max. temp. of 17th ($59^{\circ}8$)

was exceptional, but the warmth was not of long duration, the last week being very cold, with S.—*Hoar Cross*. Very dull, and bitterly cold throughout.

VII. *Ketton Hall*. Cold and changeable, with very little sunshine, and only 2 days bright, all through. S fell on 17 days, and on morning of 11th was 9 in. deep. Westerly winds on 21 days.—*Horncastle, Bucknall*. Mean temp. 3° below the average. S on 10 days.—*Southwell*. The warmest February since 1885, although the mean temp. was not above the average. R slightly above the average, and a large number of wet days; S on 12 days; little bright sunshine.—*Mansfield*. The 1st very mild, followed by a cold, wet, changeable week, with high winds and S storms. A fall of 9 in. on 10th, disappeared on 14th, and from 17th to 21st was mild, fine, and calm. The remainder was cold, with frequent slight S storms. R .28 in. below the average of 19 years.—*Hodsock Priory*. A cold, windy month, with rather deficient sunshine, but normal pressure and downfall, the latter consisting chiefly of S.—*Elvaston*. Very stormy and wintry during the first part, much drier and often cold afterwards; 17 frosty nights.

VIII. *Seathwaite Vicarage*. Mild, with little frost, and less S.

IX. *Driffeld, York Road*. Very cold and wet; severe gales on 3rd and 9th.

XI. *Douglas, Victoria Road*. The 1st was mild, followed by a cold fortnight, with W. and N.W. gales, R and frequent S. From 15th to 21st a more genial temp. obtained, but the last week was again cold, with slight S almost daily. Although the temp. was uniformly low during three weeks, no severe cold was experienced.

XII. *Melrose, Abbey Gate*. Exceedingly changeable and unsettled, with frequent gales and falls of S or H, and great range of temp. R .24 in. below the average; mean temp. 1°·9 below average; wind S. or W. on 21 days.

XVI. *Stronvar*. Temp. high, but very changeable; R large.

XVIII. *Glenaladale*. The first three weeks were very stormy and boisterous; the remainder fine.—*Drumnadrochit*. Very boisterous, with much wet S.

XIX. *Watten H.R.S.* The first 19 days one series of storms, followed by a week of fine, mild weather; very little frost.

XX. *Derry Castle*. Very stormy, with frequent falls of fine S and heavy R until 15th. Generally mild from 16th to 25th, but very harsh on the last 4 days. R an inch above

the average of 10 years.—*Nenagh, Castle Lough*. During the first three weeks the weather was wet, though the R was not heavy and the remainder of the month was variable.—*Broadford, Hurdlestown*. The first half of the month was wet and cold, the second half fairly dry and cold. There were many rainy days.—*Miltown Malbay*. Wet, blustery, and calm alternately, but mild up to the 20th, when dry, cold, frosty weather set in.

XXII. *Lawderdale*. Cold, harsh, and severe, with S on 7 days.

XXIII. *New Barnsley*. Frost, S, sleet, and R prevailed till the 20th; from 21st to 25th was spring-like, followed by S and sleet to the close.

MARCH.

I. *Lansdowne Crescent*. Severe frosts occurred during the first week, after which the temp. was extremely variable. Frost in the shade on 12 nights. R nearly the average.—*Muswell Hill*. R .83 in. less than the average. The first 18 days, with the exception of 6th to 8th and 12th, were dry, and rain fell, generally in small amounts, on the 10 remaining days.—*Finchley, Etchingham Park*. The month commenced with a period of 5 dry days, followed by 3 wet ones, then succeeded a dry period of 10 days, and the remainder was showery.

II. *Wallington*. Cool and wet, with only a moderate amount of sunlight; the first 6 days remarkably cold. R 1.01 in. above the average of 6 years.—*Hythe*. A very unsettled and wintry month.—*Keston Tower*. Not much wind, and no March dust. About the average amount of R; 12 frosty days.

III. *Bloxham Grove*. Although cold and gloomy, there was no prevalence of severe frost or parching wind; there were 24 days on which no R was registered, but heavy falls on the 6th, 7th and 8th caused a considerable flood. Prevailing winds N.W.—*Northampton, Hazlewood Road*. For the most part frosty weather prevailed, a few warm summer days occurring at intervals.

IV. *Harlow, Sheering*. R .17 in. below the average of 20 years.—*Ipswich, Bishop's Hill*. R .17 in. less than the average; temp. variable, the first week being very cold.—*Diss*. The month began with very cold weather, and daily S for the first 5 days; there was then much bright warm weather to the close, though there was a rather sharp H storm on 31st. Heavy gales from S.E. and S.W. on 7th, 8th, 9th, 19th, 20th, and 26th.

V. *Bishop's Cannings*. R .53 in. above the average.—*Babbacombe*. A

wet, cloudy, rather cold month, with bar. slightly above the average, and a large range. 3·67 in. of R and melted S fell in the first 8 days. Showery, with a few dry days at intervals, from 9th to 31st. Gales on 8th, 21st, and 26th. Heavy S on 3rd and 4th; H on 6 days, fogs on 4 days.—*Stowell Rectory*. Rather warm, mean temp., 3°·1 above the average of 5 years; R a little above the average; S on 3 days.—*Bath, Literary Institute*. The wettest month of the year, and there were heavy floods in the Avon valley, caused by R and melting S.

VI. *Further Barton*. Cold and changeable; a fall of S on the 4th; very stormy, with great changes of temp., on the 6th.—*Hampton Hall*. About 12 inches of S during the month.

VII. *Rotherby Hall*. A very wet month; 2·04 in. of R fell on the 8th, and the river Wreake twice overflowed its banks. Total R 3·85 in., the largest recorded in March during 20 years.—*Ketton Hall [Stamford]*. Cold up to the 24th, but not so much wind as usual, and dry after the 20th. Wind westerly on 21 days.—*Cropwell Grove*. R 3·46 in.; 2·06 in. above the average of 17 years.—*Southwell*. By far the wettest March in recent years. R two inches above the average two falls of more than an inch in 24 hours. The excessive R thoroughly saturated the ground, and made it in very bad order for spring sowing.—*Mansfield*. With the greatest R in March for 20 years, it was, with the exception of 4 days, a fine dry month, with an excess of frosty nights.—*Hodsock Priory*. A rather cold month (though warmer than any March of the last four), and a very wet one, with heavy floods. The total fall is probably the heaviest in March for at least 30 years; practically, the whole of it came in two heavy falls, the first on the 7th and 8th, and the second on the 19th and 20th.

VIII. *Macclesfield*. Wet and cold, without much wind. The heaviest R for March since 1880.—*Seathwaite Vicarage*. Comparatively mild, with R somewhat less than the average.

IX. *Driffeld, York Road*. The greater part dry and sunny, with the proverbial dust in quantity.—*East Layton Hall*. There was some sharp weather in the early part, with cutting winds, but the month was, as a whole, favourable.

X. *Whorlton*. S and hard frost at the beginning of the month, then fine. High winds from N. in the latter part.—*Uldale*. On the whole very mild, and almost free from frost or S.

XI. *Douglas, Victoria Road*. March set in with a very cold week

of S, sleet, and H ; the temp. of the next fortnight hardly exceeded the mean, but the last week was considerably in excess. Free from strong winds and gales ; R below the average ; S on 5 days.

XII. *Melrose, Abbey Gate*. Mean temp. $0^{\circ}\cdot5$ above, and R $\cdot61$ in. below the average. Wind S. and W. on 18 days, S. and E. on 13 days.

XVI. *Stronvar*. Temp. very changeable, but on the whole mild.—*Coupar Angus*. Low temp. during the first 11 nights, and high temp. during the last eight days. Frost on 16 days. Mean temp. $0^{\circ}\cdot7$ above the average of eight years. R much below the average.—*Arbroath Cemetery*. R $\cdot68$ in. below the average. Gentle winds prevailed till the 20th, followed by high winds from N. and S.W.

XVIII. *Glenaladale*. A fine month, but somewhat stormy, with a good deal of R towards the end.

XIX. *Watten H.R.S.* Wet, cold and windy, with an absence of severe frost.

XX. *Dunmanway, Coolkelure*. Very fine for farm work. Very mild with a minimum of March wind.—*Derry Castle*. First week rough and harsh, with heavy R, and soft S on 6th. Dry and bracing from 7th to 17th. Stormy and wet from 18th to 24th, but exceptionally mild on the last seven days. R, and rainy days both less than the average of 10 years.—*Hurdlestown, Broadford*. A very fine month for country work. R $\cdot68$ in. below the average of four years.—*Miltown Malbay, Ballyraskin*. A mild dropping month, more like April.

XXI. *Gorey, Courtown*. Very harsh and cold, but little frost at night.

XXII. *Kylemore*. A wet and cold month.—*Lawderdale*. A mild, dry month.

XXIII. *Belfast, New Barnsley*. S and frost prevailed till 8th, then variable weather till 20th ; stormy and showery till 25th, and the remainder spring-like.

APRIL.

I. *Lansdowne Crescent*. Wet ; R falling on 22 days, but mostly in small quantities.—*Muswell Hill*. R slightly below the average of 17 years, the characteristic being small amounts on a great number of days.

II. *Dorking, Abinger Hall*. Showery for the greater part and rather cold, but genial weather prevailed at the end. T and L on

6th.—*Wallington*. Very mild and damp, bringing on all out-door crops very fast. R $\cdot 34$ in. above the average of six years. Mean temp. $45^{\circ}9$.—*Keston Tower*. Very seasonable, with sunshine and showers alternating. E. winds prevailed from 4th to 16th, but there was only one frosty night. A good deal of R, and vegetation forward.—*Emsworth, Redlands*. Cold and rough, with a great absence of sun.

III. *Bloxham Grove*. There was a great prevalence of gloomy overcast weather, little sun, and a general absence of frost though the temp. was low.—*Oxford, St. Giles*. Mean temp. high, $46^{\circ}9$, but the season very late.—*Northampton, Hazlewood Road*. R very near the average; mild summer-like weather about the 18th.

IV. *Harlow, Sheering*. R $\cdot 10$ in. above the average of 20 years.—*Ipswich, Bishops Hill*. R $\cdot 16$ in. less than the average. Dull and sunless generally, with temp. below the average.—*Diss*. A coldish month, with some S in the first week. R on 22 out of the 30 days, but no heavy fall except on 23rd, when $\cdot 28$ in. fell in a furious H storm in a very short space of time. Masses of ice the size of small walnuts were interspersed with the H stones, breaking glass where exposed to them. About 40 minutes before this there was heavy T, and a bright flash or two of L, but no R. At Weybread (9 miles E.), a man and a pair of horses in an open field were killed by L.

V. *Bishops Cannings*. Typical April showers after 20th. Too cold a month for quick growing. R an inch above the average.—*Torquay, Babbacombe*. Rather cold and showery, R and bar. below the average. Warm from 1st to 3rd, and 17th to 20th; cold from 4th to 15th, and 23rd to 30th. Solar halos on four days, H on three days.—*Stowell Rectory*. A month of average temp., but excessive R and humidity, (85 at 9 a.m.). Sunshine only 86 hours.

VI. *Clifton*. The wettest April ($4\cdot77$ in.), recorded in 37 years, the nearest approach to it being in 1882 ($4\cdot07$ in.).—*Further Barton*. Cold, cloudy, and often windy and showery, with no settled warm weather; prevailing wind N.E.—*Ross, The Graig*. A very wet April, quite double the average fall.

VII. *Rotherby Hall*. R, the greatest in April during 20 years.—*Ketton Hall [Stamford]*. Very showery and dull, with T on the 11th, 23rd and 28th, and H very heavy on 23rd and 24th. Nice growing weather, but bad for corn sowing.—*Southwell*. R $\cdot 73$ in. above, and temp. $1^{\circ}6$ below the average. R every day to the 15th.—*Mansfield*.

With few exceptions the first half was dull, with heavy cold showers. It was fine from 15th to 22nd, then dull and showery to the end. R, the greatest registered in 19 years.—*Hodsock Priory*. A dull, wet and rather cold month, though the nights were mild in consequence of the cloudy sky. Vegetation rather late, and spring work hindered by the showery weather.—*Elvaston*. Very stormy and changeable. Frequent cold winds. Vegetation backward. Frost on only one night.

VIII. *Seathwaite Vicarage*. Rather disappointing, being cold, with a more than usual proportion of showery days. The upper Fells white with S or H in the second week.

IX. *Driffield, York Road*. Showery. Favourable for corn and grass, which grew freely.—*East Layton*. On the whole very cold and damp, with the exception of a few days during the latter part.

X. *Uldale Rectory*. On the whole mild and seasonable.—*Shap, Copy Hill*. A cold month.

XI. *Castle Malgwyn*. On the whole cold and showery.—*Douglas, Victoria Road*. A wretched wintry month, without a genial day. Wet and cold, with strong polar winds (N.W. to N.E.) prevailing. R in excess of any April since 1874 (except 1882). Trees leafless. Fruit trees not in blossom, the most backward spring since 1879.

XII. *Melrose, Abbey Gate*. Mean temp. ($37^{\circ}8$), $1^{\circ}2$ below the average. R 1.28 in. above the average. Wind from S. and W. on 14 days; N. and E. on 16 days, moderate in force. Notwithstanding sharp frost on the 27th, the weather was generally favourable to agriculture.

XVI. *Stronvar*. East winds prevalent. The first half of the month very changeable.—*Coupar Angus*. Temp. slightly below the average of nine years, frost on nine nights. R more than 1.50 in. above the average.—*Arbroath Cemetery*. Temp. $2^{\circ}5$ below the average and though almost identical with that of April 1888, was more equable. R nearly double the average.

XVIII. *Loch Shiel, Glenaladale*. Generally very fine. Vegetation in a forward state. The temp. in shade did not once fall to 32° .

XIX. *Watten H.R.S.* Wet and cold throughout.

XX. *Coolkelure*. The first three weeks very dry, with N. and N.E. winds.—*Derry Castle*. Stormy and wet for the first four days, generally dry and bracing from 5th to 20th, splendid weather for getting in all crops; but from the 21st to the close the weather was very unsettled, with frequent heavy falls of H, sleet, S and R. No severe

frosts. R .80 in. above the average of 10 years.—*Hurdlestown, Broadford*. Fine but cold ; till the last week water running low.—*Miltown Malbay*. More like March than April. Cold N. to N.E. winds, with light frost prevailed for the first three weeks. From the 18th, to the end boisterous from S.E., with H showers and distant T.

XXI. *Ravensdale School*. On the whole unfavourable for farm work. More R fell than in any other April during 18 years.

XXII. *Lawderdale*. Wet and damp, unfavourable for farm operations.

XXIII. *Belfast, New Barnsley*. Showery and cold, except from 12th to 19th, when it was very fine but cold. Remarkable for the absence of frost.

MAY.

I. *Lansdowne Crescent*. The warmest May since 1868, temp. in shade above 70° on nine days.—*Muswell Hill*. Total R 90 per cent. above the average of 17 years, and with one exception the wettest May during that time.

II. *Wallington*. The month was characterised by great warmth, and R above the average. Mean temp. 56°·7. Humidity 83.—*Hythe*. Remarkably fine, with high temp.—*Keston Tower*. A most genial month. Temp. considerably above the average, with a fair amount of R. No frost.

III. *Northampton*. R 1·63 in. above the average of 23 years.—*Hargrave*. Constant rains and TSS, and an absence of frost.

IV. *Harlow, Sheering*. R 2·03 in. above the average of 20 years.—*Sudbury*. Very wet ; heavy R on 9th, 10th and 11th, causing floods.—*Ipswich, Bishops Hill*. On the whole a fine hot month. R 1·20 in. above the average.—*Woodbridge, Melton*. Unusually warm, with very partial rains.—*Diss*. On the whole a warm and very beautiful month. The R, although rather heavy, all fell in 12 days. In the third week the heat was excessive, the temp. rising on 23rd and 24th to 81° in the shade.

V. *Bishops Cannings*. Generally warm and fine till the 24th, when a TS broke up the weather. Wet and much colder till the end of the month. R about the average.—*Babbacombe*. Warm, damp, misty and variable, with less R and wind than usual, but more wet days and a low bar. Showery from 1st to 9th, 16th to 18th, and 24th to 31st. Fine from 10th to 12th, and 19th to 23rd. Warm from

4th to 7th, 10th to 16th, and 19th to 24th. The mean temp. was the highest, and it was the only May without frost, during 12 years.—*South Molton, Rose Ash*. Beautiful weather ; warm and bright.

VI. *Ross, The Graig*. Another wet month. TSS frequent and severe, though of short duration. The third May in succession without frost, the min. in shade being $42^{\circ}4$. The fall in the three months, March to May, 12·73 in., is the largest recorded back to 1818.—*Cheadle*. Very wet, with much T and L, and many heavy storms.

VII. *Ketton Hall [Stamford]*. Changeable, with only two bright days up to the 7th, when heavy R with T came, and the weather was dull up to the 20th. R 6·14 in., the largest amount recorded in May.—*Southwell*. Wet and dull, but very warm. R 1·84 in., and temp. 4° above the average.—*Mansfield*. With the exception of a few heavy TSS, May was on the whole delightful. R about 1·50 in. above the average of 19 years.—*Hodsock Priory*. Warmer than any of the last 13 years, and wetter than any of them except 1886 ; nights especially warm ; a good many TSS ; wind very light ; sunshine deficient ; grass more abundant than for many years ; spring work hindered by the wet.—*Elvaston*. Genial and warm. Many showers and frequent T. Very rapid advance of vegetation. No frost.

VIII. *Macclesfield*. The finest May for many years ; no frost ; R above the average.—*Knutsford*. Very warm and pleasant, without frosts.—*Seathwaite Vicarage*. Unusually wet, with steady high temp. and no frost.

IX. *Hull, Derringham*. Very wet. R more than double the average. Severe storms of T and L on 23rd, 24th and 30th.—*Driffield, York Road*. Fine, warm and dry, excepting the last 9 days, which were wet, with heavy TSS.—*East Layton*. A very remarkable May ; no symptoms of frost during the entire month, and the weather in every way acceptable to farmers and gardeners.

X. *Whorlton*. Frequent T, and very hot weather in the latter part of the month.—*Uldale Rectory*. A glorious month, warm, with a due amount of moisture and no frosts.

XI. *Castle Malgwyn*. Unusually cold and wet.—*Douglas, Victoria Road*. The early part was cold, but a welcome change occurred on the 13th, and the backward vegetation responded marvellously.

XII. *Melrose, Abbey Gate*. The finest May for many years ; mean temp. ($49^{\circ}9$) $4^{\circ}6$ above the average ; number of frosty nights 7 below average. R ·48 in. below average.

XIII. *Edinburgh, Blacket Place*. Very fine and warm, temp. 3° above the average.

XVI. *Dollar*. Remarkable for its mild nights ; no frosts.—*Stronvar*. Very mild growing weather. R rather above the average, but temp. high, and wind southerly, all the month. Frequent T.—*Coupar Angus*. A genial month, with temp. about 4° above the average, and R also above the average. No frost, which cannot be said of any other May during the past decade.

XVII. *Ellon, Kermuck*. One of the mildest and most genial Mays remembered.—*Banff*. The finest May remembered.

XVIII. *Glenaladale*. A very beautiful month, very warm and calm.—*Drumnadrochit*. Most delightful weather, much less E. wind than usual.

XIX. *Watten*. Dry, mild and exceptionally fine, with more than the average amount of sunshine.

XX. *Derry Castle*. The finest May remembered. The first 10 days were rather wet, but from the 11th to the close the weather was delightfully fine—glorious sunshine, with many warm showers. R slightly below, but number of wet days three above, the average of 10 years.—*Tipperary, Henry Street*. Very severe up to the 13th, then very fine to the 25th, and the remainder wet.—*Hurdlestown*. The first 10 days were wet, also the last week. The rest of the month was fine.—*Miltown Malbay*. A very wet, mild month, with no drying weather. Prevailing winds S.W. and N.W.

XXII. *Lawderdale*. Wet and cold.

XXIII. *New Barnsley*. Weather variable, but always in the direction of benefiting the crops.

JUNE.

I. *Lansdowne Crescent*. Very fine and warm, with but seven days of R, and only .01 in. in the latter half. Mean temp. $62^{\circ}4$, the highest in June since 1877.—*Muswell Hill*. The first half of the month was wet ; the second half rainless, with the exception of .01 in. on the 25th. R 11 per cent. less than the average of 17 years.—*Finchley, Etchingham Park*. The whole of the R fell during the first half of the month, none falling after the 15th.

II. *Hythe*. Very fine, dry, and hot.—*Keston Tower*. Very fine and agreeable. Heavy R on 6th, 9th, and 10th ; the rest of the month dry.—*Hailsham*. North wind almost throughout, and cold at night.

--*Lewes, Iford*. Very hot and dry; a typical June.—*Warbleton Rectory*. Remarkably fine; haymaking went on uninterruptedly for four weeks, and only .01 in. of R fell between the 10th of June and the 7th of July.

III. *Bloxham Grove*. Remarkably fine and pleasant throughout, with a great predominance of N.E. winds. The night temp. was not high, but it was very hot on some occasions during the day.—*Northampton*. Very fine for hay-making; R less than half the average.

IV. *Harlow, Sheering*. R little more than half the average.—*Ipswich, Bishops Hill*. Hot and bright, especially after the 11th. R 1.50 in. above the average, mostly from TSS on 2nd, 7th, 9th, 10th, and 11th.—*Diss*. Very warm and brilliant; R fell on only five days, and on three of those it was a mere drizzle, yielding .01 in. During the greater part of the month the sky was cloudless and the heat great, the temp. reaching 86°.

V. *Bishops Cannings*. Frequent T during the first week, but splendid weather from the 16th to the close. R less than half the average.—*Hazelbury, Bryan*. Warm, with no R after the 16th.—*Babbacombe*. Warm, fine, and very dry. Great variability of temp.; large excess of N.E. winds. Showery from 1st to 3rd, 6th to 10th, and on 15th; no R measured in the last 15 days. The warmest and least cloudy month since August, 1887.—*Holne Vicarage*. In 1886 there was no R during June after the 14th, in 1887 none after the 7th, and in 1889 none after the 15th.—*South Molton*. R only .28 in., the smallest fall in June during 12 years, with the exception of 1887.—*Stowell Rectory*. Warm and dry; temp. 2°·2 above the average of five years.

VI. *Further Barton*. Fine, settled weather. TSS only on 2nd and 6th, and no R after the 15th.—*Ross, The Graig*. The smallest R in June since 1868; only .11 in. in the last 29 days. The only Junes with smaller R since 1818 were: 1822, .40 in.; 1826, .03 in.; 1868, .33 in. In consequence of previous heavy R, drought was only beginning to be felt at the close of the month.

VII. *Ketton Hall [Stamford]*. A few showery and dull days from 6th to 11th, the rest bright and very dry. R much wanted at the close.—*Southwell*. Warm and dry; temp. 1°·7 above and R 1.51 in. below the average; from the 10th to July 9th R fell on only two days.—*Mansfield*. Dry and warm; windy on the 1st, fog on the 6th, then cold and wet till 10th; afterwards fine and pleasant to the

close. R about two inches below the average.—*Hodsock Priory*. Warm, bright, and dry, very similar to June, 1887. Mean temp. higher than in any of the last 13 years. Grand weather for securing a heavy crop of hay.—*Elvaston*. Very hot, fine, and brilliant. Hay-making very advanced, and scarcely any interruption. Absolute drought from the 10th to the 28th.

VIII. *Macclesfield*. R the smallest in June since 1874, and with three exceptions since 1850.—*Chelford, Astle Hall*. Very hot, with some T.—*Hoylake*. Very dry, remarkable for the prevalence of westerly winds. S.W. 19 days. N.W. 10 days. W. 1 day.—*Broughton-in-Furness, Ulpha*. Warm and bright almost throughout.—*Esthwaite Lodge*. With only 2·47 in. of R, from May 12th, to the end of June, it is perhaps superfluous to state that water was becoming scarce, and the country much burnt.

IX.—*Driffild, York Road*. Very dry. Only ·05 in. of R fell in the 27 days, from June 9th to July 6th.—*Scarborough*. Remarkably fine, bright and dry, the temp. moderated much by breezes from the N. and E. on many days.—*East Layton*. With the exception of a couple of days in the middle of the month the weather was glorious.

XI. *Fonmon Castle*. The driest month remembered. R only ·17 in.—*Oystermouth, Newton*. Very dry, the ground cracking with drought.—*Castle Malgwyn*. Very dry and hot.—*Disserth, Glanhowey*. Very dry and hot; no R after 11th.—*Nantgwillt*. Very dry. *Douglas, Victoria Road*. Extremely fine, with only ·36 in. of R on six days, the least recorded. Absolute drought from 14th to July 6th.—*St. Helier's, Hastings Terrace*. Remarkable for two heavy falls of R, 1·37 in. on 9th, and 2·40 in. on 19th.

XII. *Melrose, Abbey Gate*. Mean temp. 1° above the average, the max. being above 80° on six days. R 1·10 in. below the average.

XVI. *Dollar*. Very warm and dry, with a great deal of sunshine and very little wind.

XVIII. *Glenaladale*. Beautiful and exceptionally dry.—*Drum-na-drochit*. Much heat and sunshine, with serious drought.

XIX. *Watten H.R.S.* Dry, bright and mild, but too dry for vegetation.

XX. *Coolkelure*. Very fine, dry and warm.—*Derry Castle*. The most favourable June remembered. The first three days were stormy and rather wet, but from the 4th to the close was exceedingly brilliant. R, and wet days much below the average.—*Hurdlestown*. Very fine. Many small streams and springs were quite dry at the

close.—*Miltown Malbay*. Generally fine and dry, and the latter half very warm and sultry.

XXI. *Dublin, Phoenix Park*. The driest June since observations commenced in 1837. R only .10 in.—*Ravensdale School*. The smallest R for June in 18 years.—*Currygrane*. A lovely month, almost as dry as the same period in 1887. Water becoming very scarce at the close.

XXII. *Lawderdale*. The first half of the month was dry but cold, the last half very dry and hot.

XXIII. *New Barnsley*. The least fall of R, and the finest June throughout, recorded here.—*Stewartstown*. R much below the average.

JULY.

I. *Lansdowne Crescent*. After the 7th the weather was cold and very wet until the 29th. Frequent TSS.—*Muswell Hill*. The first 7 and the last 4 days were dry, but R fell almost daily during the remainder of the month, the total being $1\frac{1}{2}$ per cent. below the average of 17 years.—*Finchley, Etchingham Park*. The drought which commenced on June 16th continued to July 7th, giving a period of 22 days of absolute drought. From 8th to 28th R fell on all but 5 days.

II. *Dorking, Abinger Hall*. Rather dry, warm and summerlike. R needed at the close.—*Wallington*. Cold and wet but the R was welcomed by all farmers and gardeners.—*Hythe*. The first 6 and last 5 days were very fine; from the 7th to the 26th the weather was unsettled.—*Keston Tower*. Cold and wet, except during the first week and the last three days, but no hot July weather at any time.—*Emsworth, Redlands*. Hot from 1st to 7th; disturbed with cold intervals from 8th to 22nd, and then hot again to the close. Strong winds throughout.

III. *Bloxham Grove*. Fine and pleasant at the commencement; generally showery with some heavy TSS and R from 9th to 26th, then fine with high temp. to the close.—*Northampton, Hazlewood Road*. R .60 in. above the average of 13 years. Rainless till the 9th, then showery.

IV. *Harlow, Sheering*. R .28 in. below the average of 20 years.—*Ipswich, Bishops Hill*. Several heavy TSS with much R. Weather dull and cloudy generally, and temp. below the average. R 1.05 in. above the average.—*Diss*. Fine on the whole, with a fair amount of

R and rather frequent TSS, generally slight, but severe on the 17th and 23rd.

V. *Babbacombe*. Rather wet, cold, damp, and unsettled, with rather low bar., and a large deficiency of sun heat. No R was measured in the first 6 or the last 6 days, but it was generally showery between. No gales, T, L, H, or haloes observed.

VI. *Further Barton*. The dry warm weather of June did not break up until July 7th, making in all 22 days of drought. The weather then became changeable, with T showers, but after the 26th was again fine and dry.—*Ross, The Graig*. Only 5 days which could be called hot, and only 1 with temp. above 80°. Except at the very beginning and end the weather was very showery.

VII. *Ketton Hall [Stamford]*. Changeable, with a few very cold nights and some warm bright days. W. winds on 17 days. Much T.—*Southwell*. Showery after the 8th, but few heavy falls, and the total half an inch below the average. Few TSS, and those distant.—*Mansfield*. Absolute drought from June 26th to July 9th. Unsettled from 9th to 29th. R .25 in. above the average of 19 years.—*Hodsock Priory*. Cool and showery, with average sunshine.—*Elvaston*. Fine and warm until the 8th, then cool, showery, and windy until near the end. During the 38 days from June 1st to July 8th the R was only .55 in.

VIII. *Macclesfield*. The first 8 days were very fine and warm. The remainder of the month was showery.—*Seathwaite Vicarage*. A fair amount of R, but the temp. after the first week rather low. No T throughout the month.

IX. *Driffield, York Road*. On the whole fine. Several TSS and showers.

X. *Whorlton*. Much R, with cold wind, until the last week, which was warm and fine.—*Nether Wasdale Vicarage*. The R, though abundant, came steadily, and so was most beneficial.—*Uldale Rectory*. R fell on 13 days, but the total was far short of what is required, as all the lakes and rivers were very low at the close. Temp. equable and rather low.

XI. *Douglas, Victoria Road*. Another remarkably fine month; much bright sunshine, but no great warmth. An absolute drought prevailed from June 14th to July 8th.

XII. *Melrose, Abbey Gate*. Mean temp. 1°·4 below the average; R an inch in excess. Wind S. and W. on 20 days, N. and E. on 11 days, moderate in force.

XIX. *Oban, The Corran*. Remarkably fine and dry throughout.

XVI. *Stronvar*. High temp. and R much less than usual, great scarcity of water, but grass plentiful.—*Coupar Angus*. R slightly below the average; temp. $1^{\circ}6$ below the average.

XVIII. *Glenaladale*. Most beautiful; warm, dry and calm throughout.

XIX. *Watten H.R.S.* Generally mild and fine, and free from high winds.

XX. *Coolkelure*. Very dry, warm and fine, good for everything but grass.—*Derry Castle*. A favourable summer month; very sultry for the first fortnight; wet, from 12th to 27th, but again bright and fine on the last four days. R $1\cdot59$ in. less, and wet days eight fewer, than the average of 10 years.—*Broadford, Hurdlestown*. Very fine on the whole. R below the average. A remarkable partial drought ended on the 18th, only $\cdot25$ in. of R having fallen in 35 days.—*Miltown Malbay*. Temp. for the entire month very high, the ground very dry, and pasture on light and stony soils getting burnt. A week of tropical rains commenced on the 19th, and the month closed with a warm southerly gale.

XXII. *Lawderdale*. The first and last weeks were dry, the rest of the month was wet, the R being much wanted.

AUGUST.

I. *Lansdowne Crescent*. Weather mostly cold and wet. R fell on 17 days, but in very small quantities.—*Muswell Hill*. Though the R was slightly less than the average of 17 years, the general character of the month was wet, R falling on 19 days. The last week was absolutely dry.—*Finchley, Etchingham Park*. A wet month. The wet period which commenced on July 8th, lasted 48 days, during which time $5\cdot62$ in. of R fell on 35 days.

II. *Abinger Hall*. Generally showery, cold, and unsettled, but it cleared towards the end, with a few days of good harvest weather. The ther. touched freezing point twice.—*Wallington*. Cold and damp, very unfavourable for harvest. R $\cdot53$ in. above the average of six years; mean temp. $0^{\circ}7$ below the average.—*Hythe*. Extremely unsettled and showery.—*Keston Tower*. Wet and cold, except during the last few days, which were bright and warm.—*Emsworth, Redlands*. The first three weeks were rough and wet, but towards the end brooks were getting dry and wells low.

III. *Bloxham Grove*. From 12th to 24th R fell nearly every other day, but the last six days were very favourable.—*Northampton, Hazlewood Road*. R .65 in. below the average of 23 years.

IV. *Harlow, Sheering*. R .32 in. above the average of 20 years.—*Ipswich, Bishops Hill*. With the exception of the last few days, the month was very dull and sunless, with considerable variations of temperature. R .08 in. above the average.—*Diss*. The first two days, the 8th, 15th, and the last four days were magnificent, the rest nearly all wet. Harvest was much delayed, but the brilliant and warm termination of the month came opportunely, and the clearing of the fields proceeded rapidly.

V. *Bishops Cannings*. Harvest began on the 6th, but was hindered by R; splendid weather set in on the 25th, and carrying went on rapidly. R .91 in. above the average.—*Babbacombe*. Cold, showery, and unsettled, with a large number of wet days, but R slightly below the average. Temp. at or above 70° on only four days.

VI. *Further Barton*. Showery and changeable until the last six days, which were very fine and hot; TSS frequent, but all at a distance, except on 24th.—*Ross, The Graig*. No fine, warm, settled weather until the last week, though the R was below the average. Mean max. temp. more than 2° below the average.

VII. *Ketton Hall [Stamford]*. Changeable and wet up to the 26th. Only 1 clear day and 11 bright ones during the month. Wind westerly on 29 days. Mean temp. 59°·2.—*Southwell*. The wettest August since 1881. R .75 in. above the average, temp. 1°·5 below the mean. A very unsettled period from 2nd to 26th.—*Mansfield*. On the whole unsettled and showery, with about 9 beautiful sunny days. Temp. much below the average. R .77 below the average.—*Hodsock Priory*. Cool, showery, and rather dull; harvest began about the second week, but was much hindered by the showery weather. During the last few days, however, which were very fine, it made good progress.—*Elvaston*. Very stormy and unsettled until the 25th. Very cold in general, and bad harvest weather.

VIII. *Liverpool, Breeze Hill*. R about an inch in excess of the average. The latter part of the month fine.

IX. *High Harrogate*. Very wet; only 10 dry days.—*Driffeld, York Road*. A very unfavourable harvest month; 31 days' rain (4·77 in.)—*Scarborough*. Number of wet days much above the average; the R mostly fell in heavy showers of a thundery character.—*East Layton*. Very unsettled, with much T during the greater part of the month.

X. *Keswick, Shu-le-Crow*. The wettest August since 1881.—*Uldale Rectory*. R unusually heavy, and temp. mild and equable.—*Shap, Copy Hill*. A wet month, only the last two days being free from R.

XI. *Llanfrechfa*. Harvest unusually early, and wheat ripe before oats or barley. The middle of the month was cool, but the last three days were very warm.—*Castle Malgwyn*. Unusually cold and rather wet.—*Douglas, Victoria Road*. Stormy, gloomy, wet and wintry. Temp. deficient throughout; the last week $3^{\circ}6$ below the average. A N.W. to S.W. gale, with heavy R and tremendous squalls, prevailed from 16th to 24th.

XII. *Melrose, Abbey Gate*. Mean temp. $1^{\circ}4$ below the average. R $2\cdot17$ in. below the average. Wind S. and W. on 29 days, N. and E. on two days.

XV. *Oban, The Corran*. Wet and unsettled; five days without sunshine. Mean temp. $56^{\circ}1$.

XVI. *Dollar*. Cold, dull and rainy.—*Stronvar*. Very wet and cold, very bad for hay-making.—*Arbroath Cemetery*. A fair amount of sunshine, notwithstanding the R of about double the average. Winds W. and S.W.

XVIII. *Glenaladale*. Wet and cool, with little wind.—*Drumnadrochit*. Unusually wet.

XIX. *Watten H.R.S.* Sun, shade and showers. Mild and fine generally, but a few wet and stormy days from the 20th.

XX. *Mobarnane*. The heaviest R in August during ten years.—*Derry Castle*. Remarkably wet, the total fall ($6\cdot60$ in.), having been only once exceeded in August in 13 years. The fall of $2\cdot65$ in. on the 19th, was the heaviest in 24 hours during the same period.—*Broadford, Hurdlestown*. With the exception of the last week the month was very wet. R $1\cdot92$ in. above the average.—*Miltown Malbay*. Exceedingly wet, bad for harvesting.

XXI. *Ravensdale School*. R greatly in excess of the average.

XXII. *Lawderdale*. Very wet and unseasonable.

XXIII. *Stewartstown, Ardtrea*. The wettest month on record. R $6\cdot91$ in.

SEPTEMBER.

I. *Lansdowne Crescent*. Very fine, with only $\cdot10$ in. of R between the 3rd and 19th. Temp. was high until the 15th, and low during the remainder.—*Finchley, Etchingham Park*. Dry, especially the first 18 days, no R falling from the 8th to 18th inclusive.

II. *Abinger Hall*. Fine and dry, with severe frosts on 16th, 17th, and 22nd.—*Wallington*. The first half of the month was warm and nearly rainless, the latter half wet and cold. R 1·77 in. below the average of six years. Humidity 83 ; amount of cloud 6·1 ; duration of sunlight 43 per cent.—*Hythe*. A month of splendid weather and high temp.—*Keston Tower*. Fine on the whole, the first half warm, the second half cold.—*Lewes, Iford*. Very fine, a drought of 25 days ending on the 19th.

III. *Oxford, Elsfeld*. Absolute drought from 4th to 18th inclusive.—*Banbury, Bloxham*. Mostly fine, and very pleasant, but with occasional heavy R after the 19th ; favourable for completing harvest in excellent condition.—*Northampton, Hazlewood Road*. Remarkable warmth on 11th and 12th, max. temp. 71°, T and L on 2nd. R ·51 in. below the average.

IV. *Harlow, Sheering*. R ·21 in. above the average of 20 years.—*Ipswich, Bishops Hill*. Total range of temp. very great, the first half being warm and the last half cold. R ·16 in. below the average.—*Diss*. A TS with rather heavy R on the 2nd was followed by good weather until the 15th, and the later harvest operations were completed favourably. On the 24th, between 3 a.m. and 7 p.m., 1·79 in. of R fell, and the remainder of the month was showery, unsettled, and rather cold.

V. *Bishops Cannings*. Warm at the beginning of the month, and very hot from 10th to 13th, but the next week very cold, frosts damaging vegetation on 23rd. R 1·78 in. below the average.—*Babbacombe*. Dry, fine, and rather cold, with high pressure and great variations of temp. In the 15 days, 4th to 18th, only ·01 in. of R fell. The max. in shade rose to or above 74° on 3 days, and that of 12th (78°·6) was 6°·0 above the max. of August. The max. temp. was higher and the extreme range greater, than in any of the preceding 13 Septembers. No gales or frosts.—*Stowell Rectory*. Very fine, with average temp.

VI. *Further Barton*. The first half splendid, warm and still, the last half cold and windy.—*Ross, The Graig*. Very favourable for harvest. Temp., both max. and min., almost precisely the average. R two thirds of the average. Very warm on the 12th. Max. temp. 79°·0. Wind from N. or E. on 16 days ; no gales.

VII. *Ketton Hall*. Fine and bright from 3rd to 19th, afterwards very changeable, but mostly dull and wet ; frost on 18th. Northerly winds on 21 days.—*Southwell*. Mean temp. 1°·4, and R ·48 in. below,

the average. Little R fell between the 3rd and 19th, during which period most of the harvest was secured in fair order.—*Mansfield*. On the whole dull and cold, with about seven bright days. High winds on 5 days. R half an inch below the average.—*Hodsock Priory*. Cool and dry, except for one rather heavy fall. Harvest finished generally in the early part of the month.—*Elvaston*. Very fine and pleasant (the 3rd excepted) until the 19th, afterwards stormy and windy to the end.

VIII. *Broughton-in-Furness, Seathwaite*. After the first week the weather was cold and rainy, with very little sunshine.

IX. *Driffeld, York Road*. The first half dry and fine, the latter half wet and cold.—*Scarborough*. The first half very fine and warm, the last 12 days unsettled and cold, with gales on 28th, 29th and 30th.—*East Layton*. A splendid month for agricultural purposes, and harvest finished exceptionally early.

X. *Whorlton*. The early part of the month was fine, succeeded by high cold winds from N.W. or S.W.—*Uldale Rectory*. First half fine and pleasant, second half cold and wet, with frost on 22nd.

XI. *Douglas, Victoria Road*. Fine weather, with, for the most part, easterly winds, prevailed till the 19th, from which date to the end of the month it was continuously wet. The cold from 19th to 25th was remarkable, the temp. being 6°·5 below the average.—*St. Helier's, Hastings Terrace*. Very dry; during the first 20 days only ·15 in. of R fell.

XII. *Melrose, Abbey Gate*. Favourable, though a little more wind would have been advantageous for harvest. Mean temp. 1°·9 below average. R 2·05 in. below average.

XVI. *Dollar*. Dry and fine throughout.—*Stronvar*. Favourable for harvest, the temp., on the whole, being high, though there were a few frosty nights.

XVIII. *Glenaladale*. Fine, cool, and calm, with very little evaporation.—*Drumnadrochit*. Dry and cold, with a small R.

XIX. *Watten, H.R.S.* The first two-thirds of the month were fine and mild, the remainder was unsettled, stormy and cloudy.

XX. *Mobarnane*. Exceedingly dry; water scarce.—*Derry Castle*. First half fair, and, though sunless, favourable for harvesting. Continuously misty from 16th to 23rd, then alternately bright and misty days to the close. R 56 per cent. below the average of 12 years.—*Broadford, Hurdlestown*. A very fine September. R small, and temp. very variable.—*Miltown, Malbay*. On the whole fairly good;

the first half warm and moist, the remainder broken, but with drying northerly winds, which accelerated harvest.

XXII. *Woodlawn*. Fine and drying throughout.

XXIII. *New Barnsley*. With the exception of R on 10th and 11th, the weather was very fine till the 18th, but the remainder of the month was cool, showery and stormy.

OCTOBER.

I. *Lansdowne Crescent*. The wettest October since 1882. R on 23 days; temp. low, but no frost.—*Muswell Hill*. The wettest October since 1882, the total R being 56 per cent. above the average of 17 years.—*Finchley, Etchingham Park*. Very wet; the only consecutive dry days were 3 from 12th to 14th, and 2 the 24th and 25th.

II. *Abinger Hall*. Very wet and stormy, though mild.—*Wallington*. The wettest October since 1882, but with a marked absence of frost and cold winds. R 1·60 in. above the average of six years. Humidity 89; amount of cloud 6·6; sunlight 30 per cent.—*Tenterden*. R, with one exception, the largest recorded in any month. On seven days the fall exceeded ·50 in.—*Tunbridge Wells, Camden Park*. Extraordinarily heavy R, 7·02 in. falling on 24 days. This fall has not been equalled for several years in any month.—*Bethersden*. R 7·50 in., unequalled since 1865.—*Westwell Vicarage*. R, exceeding by three inches that of any October in the preceding 10 years.—*Keston Tower*. Only four days without R. Temp. mild throughout, and gales not much felt.—*Hailsham*. The largest R in any month during the many years that observations have been made.—*Warbleton Rectory*. A phenomenal R, 9·37 in., nearly one-third of the total for the year.—*Mayfield Vicarage*. R, more than a quarter of the fall in the whole year, and more than 24 times that of June.—*Emsworth, Redlands*. R 6·64 in., 1·20 in. more than the fall of any other month since the record commenced in 1884.—*Wickham, West Lodge*. R the greatest in any month since December, 1886, and with that exception the greatest in any month during the five years in which the register has been kept.

III. *Bloxham Grove*. For the most part gloomy and rainy; there were, however, some few fine pleasant days.—*Northampton, Hazlewood Road*. R ·44 in. above the average of 23 years.

IV. *Harlow, Sheering*. R 1·26 in. above the average of 20 years.—*Ipswich, Bishops Hill*. Very unsettled and showery, with T and L on

20th and 23rd. R 1·61 in. above the average.—*Woodbridge, The Cedars*. Continued R flooded many low-lying fields. Dahlias and heliotropes remained untouched by frost at the close.—*Rendlesham Hall*. The wettest October for many years.—*Diss*. Wet, R falling on 22 days, and exceptionally heavy on 11th, 16th, 20th, and 26th. There was no severe cold nor S, and the gardens remained gay to the end.

V. *Bishops Cannings*. A favourable month on the whole, with some very pleasant days. R ·56 in. below the average of 10 years. *Babbacombe*. Cold, wet, and damp, with a low bar. R fell every day except 1st, 14th, 24th, and 25th, though not always in measurable quantity. Cold from 1st to 14th, and 19th to 27th. Fog on four days.—*Stowell Rectory*. A rather rainy month, with temp. about the average.

VI. *Ross, The Graig*. Number of rainy days (26) only once equalled in 30 years, but the total fall exceeded six times. Mean temp. slightly below the average, but no severe frosts.—*The Clive Vicarage*. Unusually wet.

VII. *Ketton Hall [Stamford]*. Very wet, with only seven bright days.—*Sleaford, Bloxholme*. Will be long remembered for its R of 5·40 in. on 25 days.—*Horncastle, Bucknall*. Exceedingly wet and dirty.—*Southwell*. Warm and wet; R every day except one after the 14th, but no exceptional falls.—*Mansfield*. Dull, wet, and changeable. Only six fine, pleasant days.—*Hodsock Priory*. A very dull and damp month, rather cold, wet, and calm; constant snowery weather, but without any heavy falls; very few frosts, but cold days.

VIII. *Knutsford*. A damp month, with not many bright days; scarcely any frost, and a very small range of temp.—*Seathwaite Vicarage*. Unusually mild, with more than the average R.

IX. *Driffield, York Road*. Exceptionally wet. R on 24 days; sunshine consequently deficient.

X. *Uldale Rectory*. Wet and disagreeable, with very short intervals of fair weather.—*Ulpha Vicarage*. Generally mild and open, with some heavy storms and a large R.

XI. *Castle Malgwyn*. Very wet; only six really fine days.—*Douglas, Victoria Road*. R below the average, but number of wet days large. Cold, and for the most part strong E. gales prevailed from 17th to 28th, but otherwise fair autumn weather characterised the month.

XII. *Melrose, Abbey Gate*. R 2·05 in. above the average; mean

temp. $1^{\circ}6$ below the average. Wind S. or W. on 20 days; N. or E. on 10 days.

XV. *Oban, The Corran*. Beautifully fine for the first three days, then unsettled till the 17th. The weather gradually improved, and from 20th to 28th was splendid autumn weather.

XVI. *Stronvar*. Wet, but mild; grass growing freely; a great deal of S. wind.—*Coupar Angus*. Wet days very numerous, but R only slightly above the average.—*Arbroath Cemetery*. R about half an inch above, and mean temp. about 2° below, the average. Prevailing winds N. and E.

XVIII. *Glenaladale*. Exceedingly beautiful; great prevalence of very calm weather.

XIX. *Watten H.R.S.* Wet, mild, and calm.

XX. *Tipperary, Henry Street*. Very wet, and at times stormy.—*Derry Castle*. Generally wet and stormy for the first three weeks and the last three days; dry and bracing from 23rd to 28th. R $\cdot 44$ in., and wet days 5 above the average.—*Broadford, Hurdlestown*. R $\cdot 26$ in. above, and rainy days 8 above, the average of five years. The R fell generally in the evening or at night.—*Miltown Malbay*. Cold, stormy, and wet, without the rainfall being excessive.

XXI. *Currygrane*. On the whole stormy, with more than the average R.

XXII. *Lawderdale*. A wet, unseasonable month.

XXIII. *New Barnsley*. Though the R exceeded the average, most of it fell at night, 18 days being fine or very fine.

NOVEMBER.

I. *Lansdowne Crescent*. Mild and very dry. The R ($\cdot 76$ in.), probably the smallest in November since 1871. No R fell during the 19 days, 3rd to 22nd.—*Muswell Hill*. The driest November since 1879, and with the exception of that year, the driest in 17 years, the total fall being only three eighths of the average.—*Finchley, Etchingham Park*. Extraordinarily dry, with an absolute drought of 19 days, from 4th to 22nd.

II. *Abinger Hall*. Dry, with fogs and dull weather generally prevailing. Some sharp frosts occurred at the end.—*Wallington*. Mild and damp, with comparatively little frost, and a very small rainfall. Humidity 91; amount of cloud $7\cdot 2$.—*Hythe*. The first three weeks very mild and gloomy, the last week squally and frosty.—*Lower*

Walmer. Very fine, especially the last ten days, frequent fogs occurring in the early part.—*Keston Tower.* Extremely mild; calm and light winds, and little or no fog.—*Emsworth, Redlands.* Gloomy, foggy and cold, with N. to E. winds; hard frost from 25th to 30th.

III. *Bloxham Grove.* The weather at the beginning of the month was mostly fine and pleasant. From 14th to 25th, there were fogs almost daily, and thence to the end it was fair and bright. No R fell in the 13 days ending on 16th.—*Northampton, Hazlewood Road.* R less than one-third of the average of 23 years, and with one exception the smallest in November during that time. Wind between N.W. and S.W. the entire month, except from 18th to 22nd.—*Hargrave.* Remarkably dry, with high pressure.

IV. *Harlow, Sheering.* R 1·40 in. below, or about two-fifths of, the average.—*Ipswich, Bishops Hill.* R ·89 in. less than the average.—*Diss.* Much fine bright weather in the first fortnight, then ten days dull and sunless, with little R and no great cold; heavy S on 26th, 27th and 28th, and the last day brilliant.

V. *Bishops Cannings.* A few frosts on grass at the beginning of the month, but very warm during the day until the 25th.—*Babba-combe.* Warm, damp, cloudy, gloomy and misty, with small R, and few wet days; high winds, and high bar. The mean force (2·0), and velocity (7·9 miles) were the lowest observed in November.

VI. *Ross, The Graig.* Very fine and dry, with only one gale of wind. The max. temp. on 7th and 8th, 63°·3, and 63°·8, are the highest recorded in November.

VII. *Rotherby Hall.* R only ·72 in., the smallest fall in November for 20 years.—*Southwell.* Warm and very dry, the driest November since 1862. R 1·49 in. below the average. S fell on three days.—*Mansfield.* The early part of the month was mild and hazy, with thick fogs on 12th and 13th. The last week cold and damp, with S storms on 25th and 26th, and sharp frosts. R less than a quarter of the average.—*Hodsock Priory.* Mild, calm and very dry. R less than half that recorded in November in any of the previous 14 years.—*Babworth Hall.* Remarkably small R, only ·42 in.—*Elvaston.* Very dry and quiet generally; mostly mild until the 25th. Afterwards wintry. Six frosty nights.

VIII. *Broughton-in-Furness, Seathwaite Vicarage.* Mild, with very little sunshine till the last week, when the weather became cold and wintry.

IX. *Hull, Derringham.* The driest November for 40 years. R only

·38 in.—*Driffild, York Road*. Comparatively dry; the latter part cold and winterly. S on 27th.—*Thixendale*. Remarkably fine, warm and still, scarce a breath of wind day after day.—*Scarborough*. Fine and very mild until the 25th, then a winter storm from N.W., with deep S, and much H.—*East Layton*. Very fine and mild, with little S, and a small R.

X. *Whorlton*. Fair and warm until the last five days, which were cold, with strong N. wind.—*Mealsgate, Uldale Rectory*. Unusually dull and foggy, with a small R.—*Eskdale Vicarage*. Very wet at the commencement of the month. S towards the close, but all gone by the end.—*Ulpha Vicarage*. With the exception of three or four days of sunshine, the month was uniformly and exceptionally dark.

XI. *Douglas, Victoria Road*. Very fine and mild, though a somewhat heavy fall of S occurred on the 26th.

XII. *Melrose, Abbey Gate*. R less than a quarter of the average. Mean temp. $1^{\circ}1$ above the average. Wind from S. or W. on 29 days.

XIII. *Edinburgh, Blacket Place*. Very dry, R falling on only one day after the 5th; very mild, the mean temp. up to the 18th being nearly 7° above the average.

XV. *Oban, The Corran*. Temp. high, with small range. The weather was heavy, dark, and occasionally misty. S fell on the 26th, and it was frosty until the 28th, when mildness and damp returned.

XVI. *Stronvar*. Very mild generally, but moist, though the R was much below the average.—*Arbroath Cemetery*. R about one-third of the average; mean temp. above the average.

XVIII. *Glenaladale*. Extraordinarily mild and calm.

XIX. *Watten H.R.S.* The first three weeks were calm, mild, and exceedingly fine, remarkable for the exceptionally high temperature. In the last week a sharp S storm occurred.

XX. *Derry Castle*. Remarkably mild and soft until the 26th, when S fell, followed by frost. R not much more than half the average of ten years.—*Broadford, Hurdlestown*. A very mild month, and the driest on record. R 1.04 in. below the average of five years.—*Miltown Malbay*. Mild and moist, with scarcely any sunshine up to the 25th, when a sudden change of temp. occurred, ushering in the first S of the season.

XXIII. *Belfast, New Barnsley*. With the exception of storm on 26th and 27th, the weather was remarkably open and mild.

DECEMBER.

I. *Lansdowne Crescent*. Excepting from the 15th to the 25th, the weather was cold, with frost on 15 nights. R about the average.—*Muswell Hill*. Though the R was only 42 per cent. of the average, the number of rainy days was rather large.—*Finchley, Etchingham Park*. Though the total R was small, it cannot be described as a dry month, for wet mists prevailed on many days.

II. *Abinger Hall*. Seasonable and rather dry. Fogs more prevalent than usual.—*Wallington*. Very open, but unpleasant and rather foggy. R less than, and temp. about the same as, the average. Mean humidity 93; mean amount of cloud 6·7; both above the average.—*Keston Tower*. The first week was cold and frosty, with a few days' skating, and frost prevailed during the last week. The atmosphere was unusually still, but there was not much fog.

III. *Bloxham Grove*. Fair, with nine bright days; a good deal of frost, but not continuous.

IV. *Ipswich, Bishops Hill*. An unusual amount of fog and mist, with great dulness and very little wind. R ·52 in. below the average.—*Diss*. Fair till 12th, with some beautiful days. Dull and nearly sunless from 13th to 21st, then warm and damp to the end, with the exception of Christmas Day and the 31st, which were brilliant.

V. *Bishops Cannings*. R about two-thirds of the average.—*Babbacombe*. Rather cold, misty and dry. No R was measured on the first five days, or from the 25th to 30th; there were frequent showers from 6th to 24th. The mean hourly velocity of wind was less than any observed in the preceding 10 Decembers.—*Stowell Rectory*. Remarkable for low wind force; mean temp. 1°·8 below the average.

VI. *Ross, The Graig*. Very dry, though not settled, cold and warmth alternating quickly. Prevailing winds S.E. to S.W.

VII. *Horncastle, Bucknall*. Very fine and dry on the whole. Mean temp. 3°·5 below the average.—*Southwell*. R half an inch below the average, though there were many wet days. S fell on one day only.—*Mansfield*. Very changeable; cold and frosty at the beginning, very mild in the middle, and cold again at the end. R ·77 in. below the average of 19 years.—*Hodsock Priory*. Dull, calm, and rather dry, of about average temp. and high pressure; only one fall of S, and that did not lie long.—*Elvaston*. A variable month; frequently frosty. Very great and rapid changes in the temp. about the middle. 16 frosty nights.

VIII. *Seathwaite Vicarage*. Raw, cold, and sunless, with little frost, and almost an entire absence of S.

IX. *Driffeld, York Road*. Cold, dry, and sunless ; 18 nights with frost in screen. S on 7th.

X. *Ulpha Vicarage*. Generally dark and cloudy, with very few bright days.—*Shap, Copy Hill*. Fine and mild, more like September.

XI. *Douglas, Victoria Road*. Mild and damp ; the air completely saturated ; flowers in bloom at the close.

XII. *Melrose, Abbey Gate*. Singularly mild ; mean temp. 6° above the average. R .29 in. less than the average.

XV. *Oban, The Corran*. Generally bad weather ; gloomy and overcast skies, and absence of frost.

XVI. *Dollar*. Mild and fine throughout.—*Stronvar*. Very mild and dull ; little or no sunshine.—*Coupar Angus*. R .73 in. below the average ; temp. slightly above the average.—*Arbroath Cemetery*. Dull and mild throughout. R only half the average.

XVIII. *Glenaladale*. Very wet, and rather stormy.—*Drumnadrochit*. Remarkably fine and open.

XIX. *Watten, H.R.S.* Exceptionally mild, fine, and open.

XX. *Dunmanway, Coolkelure*. Wet ; not from any extraordinary rainfall, but from the general humidity of the atmosphere. Very unusually mild, neither frost nor S. Prevailing winds S. and W., with some rough gales from the Atlantic.—*Broadford, Hurdlestown*. Very mild and unhealthy ; no large falls of R.—*Miltown Malbay*. With the exception of the first five days, a very rainy month, but exceedingly mild.

XXI. *Currygrane*. On the whole very boisterous, and the land saturated everywhere.

XXII. *Clifden, Kylemore*. Wet, but not cold.—*Lawderdale*. A wet, harsh month.

XXIII. *New Barnsley*. Fine till the 6th. From 6th to 23rd variable : frosts, sleet, R, stormy, and very fine. From 24th to the end, fine, mild, spring-like weather.

OBSERVERS' NOTES ON THE YEAR 1889.

ENGLAND.

DIVISION I.—MIDDLESEX.

TEDDINGTON.—The water level remained very low to the end of the year, the heavy R of October affecting it very little.

LANSDOWNE CRESCENT.—Remarkable as having the greatest number of rainy days since 1882. There was an absolute drought, lasting 19 days, in November, and during 22 days ending July 7th only .01 in. of R fell.

CAMDEN ROAD.—The summer was marked by 22 days, from June 16th to July 7th, without measureable R, and by 34 wet days out of 48 days from July 8th to August 24th.

HAMPSTEAD, ROSSLYN HOUSE.—A fine season till July, which, with August, was very wet, with little sun.

MUSWELL HILL.—R 2.01 in., or 7 per cent. less than the average of 17 years. In February, May, and October there was an excess, while in each of the other nine months there was a deficiency—very trifling in July and August.

FINCHLEY, ETCHINGHAM PARK.—The alternation of wet and dry periods was very marked; April 21st to June 15th, 56 days, 7.00 in. of R fell on 32 days; an absolute drought of 22 days followed, June 16th to July 7th; another wet period, July 8th to August 24th, 48 days, with R on 35, 5.64 in.; a dry period again, from August 25th to September 18th, .16 in. of R on 3 days; from September 19th to November 3rd, 5.89 in. on 46 days, and an absolute drought of 19 days from November 4th to 22nd.

MONKEN HADLEY.—Absolute drought prevailed for 22 days from June 16th to July 7th, and for 19 days from November 4th to 22nd.

DIVISION II.—SOUTH EASTERN COUNTIES.

KENLEY, INGLESIDE.—A much finer year than 1888, with favourable weather, both for hay and corn. January had many fogs; R

fell on only 5 days in June ; from June 16th to July 6th, 21 days, no R fell, and from August 25th to September 18th, 25 days, only .01 in. fell. October was very wet, followed by a fine, mild November.

WALLINGTON.—R about .50 in. below the average ; a fairly prosperous year for all agriculturists.

TENTERDEN.—Another year with R below the average. January, May, June, November, and December were dry, November and December only twice having a smaller total in 27 years, and May and June only three times. The fall of October, 7.51 in., has only once been exceeded. High winds only on February 8th and March 8th ; November gales absent. Heavy TSS in May and June. Three weeks of August very wet ; September very fine ; October very wet, with frequent TSS during the first ten days.

KESTON TOWER.—A moderately cold winter was succeeded by a seasonable spring and summer. November and December were characterized by unusual stillness of the air.

MARGATE, APSLEY HOUSE.—R half an inch below the average of ten years. No fall of an inch in 24 hours was recorded.

CHICHESTER, WESTGATE.—R 3.30 in. below the average of 50 years.

CHICHESTER, CHILGROVE.—R 3.60 in. less than the average of 56 years.

MARESFIELD, FOREST LODGE.—The R was 1.88 in. in defect of the average of 30 years. It was in excess of the average in February, March, April, July, August and October, but in defect in January, May, June, September, November, and December. The R in June (.26 in.) was the smallest but one registered, the exception being in 1858, when only .24 in. fell. The amount of fog during the latter part of the year was unparalleled.

CROWBOROUGH OBSERVATORY.—R 2.20 in. below the average of 19 years. May and June were very fine, July and August wet and gloomy. No severe frost occurred throughout the year, nor was there any very severe gale.

SOUTHAMPTON, CADLAND.—Although the fall for the year is five nches below the average, the R appeared always to come at the right time, and in abundance.

ALDRESHOT.—R small, and a general absence of heavy R ; only one day had a fall of more than an inch, and only five days more than half an inch. Total fall about 3 inches below the average.

DENFORD.—R about six inches below the average of 10 years, although the number of rainy days exceeded the average by 25.

READING, EAST THORPE.—R 4·69 in. below the average of 10 years, but rainy days 17 above the average.

DIVISION III.—SOUTH MIDLAND COUNTIES.

ST. ALBANS, THE GRANGE.—January, February, March, June, November, and December were dry months, with an average fall of 1·49 in. April, May, July, August, September, and October were wet, with an average fall of 3·21 in. June, September, and November had an average of only 7 wet days. The longest period without R was 23 days from June 16th.

SLOUGH, LANGLEY.—R 4·50 in. below the average of 17 years. Weather generally favourable throughout the year.

GREAT MARLOW.—R 3·26 in. below the average of 10 years.

FILGRAVE RECTORY.—R 3·28 in. below the average of 15 years.

CULHAM VICARAGE.—R four inches below the average, and the springs were getting low at the close.

PYRTON MANOR.—Two absolute droughts were recorded, one of 23 days, and one of 19 days.

FAWSLEY.—On the whole fine and seasonable, except in July and August, when it was cold and wet.

MAXEY VICARAGE.—R 1·11 in. below the average of 8 years. More than ·50 in. fell on 6 days. The longest period without R was 15 days, from September 4th, and the longest rainy period 17 days from October 18th.

ASPLEY GUISE.—R 2·86 in. less than the average of 30 years.

TEMPSFORD HALL.—R 1·29 in. above the average of 17 years. May very wet, with floods, but very few floods in the remainder of the year.

FULBOURNE ASYLUM.—Unusually heavy R, without an excessive number of rainy days. Between June 12th and July 10th only ·03 in. of R fell, and between August 26th and September 19th only one shower. Plenty of bright sunshine.

STRETHAM FERRY.—The wettest year since 1852. The washes were flooded from bank to bank no less than four times during May, June, and July.

DIVISION IV.—EASTERN COUNTIES.

SAFFRON WALDEN.—R 2·10 in. above the average of 20 years.

IPSWICH, BISHOP'S HILL.—R 2·45 in. above the average ; May, June, July, and October were much above, while January and November were considerably below the average.

RENDLESHAM HALL.—A very wet year, with heavy TSS in summer, and the wettest October for many years. Three days out of four in June gave 1·82 in., 1·28 in., and ·65 in.

DISS.—In the first months of the year there was no long continued cold, but the spring was late, and there were frequent falls of S in March and April. The hay crop was well got up, the early summer weather being very beautiful. The harvest was abundant, but late, owing to wet weather in August. The autumn was fine, and, with the exception of a few cold and snowy days in November, the weather remained open till the end of the year.

GELDESTON.—R ·72 in. below the average. No R from June 11th to July 6th. R above the average in April, May, August, September and October.

GREAT YARMOUTH.—S fell on 35 days ; H on 31 days. Fog occurred on 112 days ; TSS on 15 days, frost on 78 days. Longest drought June 11th to July 6th inclusive.

NORWICH, ESSEX STREET.—R about the average. Only 4 rainy days in June.

NORWICH, BLOFIELD.—The early months of the year were severe, with frost and S. The spring was cold till May, which was a forcing month. June was very dry, absolute drought prevailing from the 10th to July 7th. July and August were very showery, and September, though fine at the commencement, was cold and wet at the close. October was rather wet. The R of November and December was small, but there was much humidity.

EAST DEREHAM.—The R of the first 3 months was below the average. June was a lovely month, with high temp., but was followed by a wet July and August. The first half of September was fine, and there were some lovely days in October and November. R of the year about the average.

HILLINGTON.—The year is remarkable for the number of falls (4) above an inch in 24 hours. January, November, and December were dry ; August was very wet.

DIVISION V.—SOUTH WESTERN COUNTIES.

FIGHELDEAN, SYRENCOT.—The springs were very low at the end of the year, and the river was about ordinary summer level.

BISHOPS CANNINGS.—R, with three exceptions, the smallest in 16 years, being 6·32 in. below the average. Number of wet days only two less than the average.

MILDENHALL.—R 6·93 in. below the average of 24 years, during which time only four years have had smaller totals.

LANGTON HERRING.—R 7·31 in., or 24 per cent., less than the average of 14 years, and the smallest, with the exception of 1887, when the fall was exactly an inch less.. Drought prevailed from June 15th to July 6th, and September 3rd to 18th.

TARRANT KEYNSTON.—The river Tarrant dried up, which has occurred only 4 times in 23 years. R 6·25 in. less than the average.

PLYMOUTH, HOBART TERRACE.—R 3 per cent. below the average. Temp. about the average. Seven months had a R below the average, and June was exceptionally dry. Sunshine 33 per cent. of the possible duration.

BABBACOMBE.—A rather cold, damp year, with a high bar. and light winds. R 12·03 in., or 31 per cent., below the average, the fall being the smallest recorded during 12 years, except 1887. The longest wet period was 11 days, from March 1st to 11th, and the longest dry period 21 days from June 16th to July 6th. March, July, and October were wet months; the rest were dry, especially January, June, and September. May, June, and November were warm; the other months, excepting January, were cold.

WATCOMBE PARK.—March, July, and October were wet; February, June, and September very dry. There were a few heavy falls in 24 hours.

HOLNE VICARAGE.—R much below the average, and, with the exception of 1887, the smallest in any year since 1870.

ASHBURTON, DRUID HOUSE.—R 19·97 in. less than the average of 12 years. Springs in the neighbourhood very low at the close.

AXMINSTER, GREAT TRILL.—R 8·15 in. below the average of 5 years.

PILTON.—A very fine year. January dry and warm, February wet, cold and windy, April very fine, May variable, June glorious; no R from the 16th to July 7th, when wet, sultry weather set in. August windy, wet and cold, September fine and hot, October wet and cold, November and December mild.

ALTARNUN.—This, with Bolventor, enjoys the honour of being the wettest and most boisterous station in the county. Only during five months out of the twelve did R fall on less than 20 days.

CREWKERNE, BINCOMBE HOUSE.—R 11·50 in. below the average of 20 years. June was remarkably hot and dry, and November and December were very fine, dry and mild.

WHITE LACKINGTON.—R 8·69 in. below the average of 18 years, and the smallest in any year except 1887. Temp. above the average.

MILVERTON.—R 5·19 in. below the average of 5 years.

EXFORD RECTORY.—R the smallest in any year since observations commenced in 1876, being ·61 in. less than the fall in 1887. There was only one fall exceeding an inch in 24 hours, but the number of rainy days was considerable. Drought prevailed from June 16th to July 6th, and the earlier part of September was very fine.

STON EASTON.—R 6·75 in. below the average of 21 years.

HARPTREE COURT.—R 6·93 in. below the average of 7 years, the falls in January, September, and November being very light. There were 15 consecutive dry days from September 4th.

DIVISION VI.—WEST MIDLAND COUNTIES.

GLOUCESTER, LOWER BARTON STREET.—R slightly below the average, and 45·9 per cent. of the total fell in the three months March to May. There was a drought of 21 days from June 16th to July 6th, and a partial drought of 38 days from June 2nd to July 19th, with a fall of ·19 in. The number of rainy days was below the average, and, except the three wet months of spring, the weather was generally good.

COLWALL.—R 6·32 in. below the average of 13 years. 28 consecutive days without R, from June 11th to July 8th.

PEMBRIDGE, MARSTON.—R 1·85 in. less than the average of 10 years. No R from June 10th to July 7th, both included.

HANDSWORTH.—R 4·14 in. below the average. Absolute drought prevailed for 28 days from June 11th to July 8th. R fell on 20 successive days from October 15th to November 3rd.

BURTON, SHOBNALL.—R ·50 in. below the average of 14 years; rainy days 17 below the average.

TEAN VICARAGE.—The most notable features were the warm May, the dry June, the unseasonable rains in July, August and part of September, the dull wet October, and the remarkably high bar.

pressure in November and December. R about 16 per cent. below the average of the ten years 1875-84.

WORCESTER, ST. GEORGE'S SQUARE.—The driest year, excepting 1887, since observations commenced in 1876.

DIVISION VII.—NORTH MIDLAND COUNTIES.

UPPINGHAM.—Eight months had less, and two little more, R than the average, and but for the heavy fall in April and May, the scarcity would have been very serious.

DODDINGTON.—R about 2·50 in. above the average. There were 23 days absolutely without R, from June 16th to July 8th, while R fell on 26 out of the 40 days following St. Swithin's, and on 25 days in October.

LOUTH.—R·17 in. above the average of 25 years. Mean temp. 47°·5.

SHELTON RECTORY.—A wet year, but periods of wet and dry weather were very distinctly defined—thus, in March there were 23 days, and in October 29 days, of R, while in June there were 24 days of fine weather. November was unusually fine and mild. Hay was well got in, but the wet August injured corn.

SOUTHWELL.—R probably about an inch above the average. March and May were very wet months, and undoubtedly damaged the corn crops on heavy land. However, a dry June and July improved matters. August was unsettled, and delayed harvest, which was in the end secured in fair order in September. A dry November was most welcome to farmers after a damp October. The temp. in three months only, May, June, and November, was much in excess of the mean, while January, April, August, and September were decidedly cold.

HODSOCK PRIORY.—A normal year, except for a rather persistent deficiency of sunshine. The winter and early spring were cold, though without exceptionally severe weather; then followed two warm months (May and June), which were succeeded by a cool period lasting to the end of October. November was mild, and December of about average temp., the result being that the mean temp. for the whole year is a few tenths below the average. The total R is about the average; the largest excesses were in March and May, and the largest deficiencies in June and November. April was also a wet month, while September and December were dry ones. There were only two falls of more than an inch in 24 hours,

both in March. Sunshine was very deficient, and the only month in which there was an excess was June ; only 1,086 hours were recorded in the year, which is just a quarter of the time the sun was above the horizon, and 157 hours less than the average of 8 years.

ELVASTON.—The first four months were rather colder than the average, with a moderate R. May and June were favourable, the latter being remarkably fine and warm. From July 8th to nearly the end of August very rainy and cold ; September and November dry and fine ; October and December very changeable. Mean temp. 47°·7. 43 frosty nights in the early months, 24 in the latter.

DIVISION VIII.—NORTH WESTERN COUNTIES.

HINDERTON.—R 3 per cent. more than the average of 20 years.

FRODSHAM, FOXHILL.—R about six inches below the average. June was the driest month remembered, R falling on only four days.

AIGBURTH, KELTON.—R more than an inch below the average of 10 years. January and June were very dry, and July and August very wet, with an aggregate fall of 8·87 in. The falls of the other eight months were remarkably uniform, the extreme variation only just exceeding ·75 in.

LIVERPOOL, GROVE PARK.—R 1·28 in. below the average of 26 years. Mean temp. 0°·5 above the average.

OVER DARWEN.—The driest year in a record of 17 years, with the exception of 1887.

BLACKPOOL, SOUTH SHORE.—R 3·51 in. less than the average of 34 years.

BARROW-IN-FURNESS.—R ·59 in. below the average of 17 years, and number of wet days 3 above the average.

HOLKER GARDENS.—R five inches below the average of 15 years. May very fine, without frosts, and June very hot and dry, no R falling after the 14th till July 9th.

BROUGHTON HALL.—Another dry year, with 6·84 in. of R less than the average of 21 years. Eight months had an almost equal fall of between 3 and 4 inches ; August and October had the heaviest falls, with an aggregate of more than a quarter of the year's total, while June and September were exceptionally dry.

ULVERSTON, COLTON.—R 6·72 in. less than the average of the 18 years ending 1886.

ESTHWAITE LODGE.—The spring was early, without a check, and

June was hot and dry, no R falling for 21 days after the 14th. The fall of July was not sufficient to penetrate more than two or three inches, and the springs were all dry and water scarce. The R for the year is 14 inches below the average, showing a total deficiency on the three years 1887 to 1889 of 53 inches.

DIVISION IX.—YORKSHIRE.

WATH-ON-DEARNE, CHAPEL STREET.—R 18 in. below the average of 25 years. June and November each had only about a quarter of the average.

MELTHAM, HAREWOOD LODGE.—The third successive dry year, the R being 11 per cent. below the average. June was exceedingly fine and dry, and there were 25 consecutive rainless days after the 10th. November, also, was remarkably dry. TSS were frequent.

THIRSK, SOWERBY.—R 4.17 in. below the average of 10 years, and the smallest in any year except 1887.

INGLEBY MANOR.—The spring was the warmest and earliest for many years, but was followed by a wet and dull July and August. R above the average, and the warmest year since 1884.

DIVISION X.—NORTHERN COUNTIES.

SEAHAM VICARAGE.—The smallest R in 30 years, with the exception of 1884.

SUNDERLAND, WEST HENDON HOUSE.—R 2.28 in. below the average 1860–1877, and the least since 1874, with the exception of 1884. June and November were the driest months of those names recorded, observations commencing in 1860. R to the amount of .61 in. having fallen on only four days in June, and seven in November. Considering the eight principal points of the compass, there was a marked deficiency of S.E. and S. winds, and an excess of N. There was a great excess of E. winds in April, and of N.E. and E. in October, while in November and December the wind scarcely blew at all from these points, the entire duration from N., N.E., E. and S.E. being only about 72 hours. The N.E. wind was the wettest in proportion to the time it blew, and the W. as usual, was the driest.

BINGFIELD.—R 1.74 in. less than the average of 57 years.

WHITEHAVEN.—R 6.71 in. below the average of 13 years.

KESWICK, SHU-LE-CROW.—R the smallest recorded in any year except 1887.

COCKERMOUTH, WHINFELL HALL.—R more than 10 inches below the average, and with the exception of 1871 and 1887, the smallest for 34 years.

CARLISLE, WREAY VICARAGE.—R 5·22 in. below the average of ten years, ending 1885. Springs failed in June, but were revived in July and August.

AMBLESIDE, NOOK COTTAGE.—R 18 inches below the average, and with the exception of 1887, the least registered during 15 years.

KIRKBY STEPHEN.—With one exception (1887) the smallest R in 25 years, and nearly 6 inches below the average.

WINDERMERE.—R 1·70 in. below the average of seven years.

DIVISION XI.—MONMOUTH, WALES, AND THE ISLANDS.

TREDUNNOCK.—R about 7 inches below the average.

NEATH, FAIRYLAND.—Although R fell on 199 days, the total is far below the average, and only ·16 in. above that of 1887, the driest year recorded. There was a great scarcity of water in Neath during the summer months, and even at the end of the year the river and brooks in the neighbourhood were decidedly low.

NANTHIR RESERVOIR.—R the smallest in any year since the gauge was fixed in 1877, and 1·27 in. less than the fall of 1887.

NEW RADNOR, DOWNTON.—R at least 5 per cent. below the average. Absolute drought prevailed for 28 days, from June 10th to July 7th, and but for slight showers on June 8th and 9th, would have lasted 35 days. April and July were very wet, each having about double the average R.

RHAYADER, NANTGWILLT.—R much below the average. January, November and December, usually wet months, having been comparatively dry.

ROSSET, TREVALYN HALL.—R again below the average. Three months, March, April and July, had more than the average R, and the remaining nine had less, January and June being remarkably dry. Between June 8th and July 9th, only ·02 in. fell.

LLWYDIARTH ESGOB.—The smallest R on record, except 1887. Springs low up to October.

DOUGLAS, VICTORIA ROAD.—A fine year, R upwards of seven inches below the average and the lowest, except 1887, in 16 years.

It was (save the drought in June and the excess in August) pretty evenly distributed. There was only one fall of an inch in 24 hours. The year was even more remarkable for its almost complete immunity from severe gales.

SCOTLAND.

DIVISION XII.—SOUTHERN COUNTIES.

EWES, BURNFOOT.—R 9·96 in. below the average of 8 years.

MELROSE ASYLUM.—R 1·07 in. above the average of 7 years, but rainy days 13 less than the average.

DIVISION XIII.—SOUTH EASTERN COUNTIES.

INNERLEITHEN.—A remarkably fine summer. R in April and August considerably above the average. The autumn months unusually mild.

DIVISION XIV.—SOUTH WESTERN COUNTIES.

HAMILTON, ARDENCLUTHA.—An exceptionally dry and warm year, July and August were the wettest months, but a dry September saved the crops.

DOCHROYLE.—R 5·31 in. below the average of 14 years.

DIVISION XV.—WEST MIDLAND COUNTIES.

BUCHLYVIE.—An unusually dry and fine year. The latter half of May, June, July, September, and November, particularly fine.

ROTHESAY, CRICHTON ROAD.—R 6·06 in. less than the average.

ISLAY, ARDBEG.—One of the driest years on record.

DIVISION XVI.—EAST MIDLAND COUNTIES.

KINROSS, TURFHILLS.—Very mild and open during the early and late months of the year. Excessively hot and dry at the end of June and beginning of July, and equally wet in August.

CALLANDER, LENY.—The smallest R in any year since observations commenced in 1852.

COUPAR ANGUS.—R 2·57 in. and number of rainy days 6 below the average of ten years. No R fell in the 20 days from June 16th

to July 5th, and there were 20 consecutive wet days from October 17th to November 5th.

DIVISION XVII.—NORTH EASTERN COUNTIES.

FETTERCAIRN.—Warm, genial and productive, with a R less than the average. April and August were rainy months, the latter being the rainiest for 40 years; May and September were dry and warm.

MIDMAR, BLACKSTOCK.—The driest year since observations commenced in 1866, May and June specially dry.

WESTER ELCHIES.—May and June were remarkably dry, only .92 in. of R falling in the 67 days from May 1st to July 6th.

GORDON CASTLE.—The spring and autumn were dull and open with little frost or S. May and June were remarkably dry and warm, July and August wet.

DIVISION XVIII.—NORTH WESTERN COUNTIES.

FORT AUGUSTUS.—A notably dry year; the drought in June and July caused a stoppage of traffic for a distance of ten miles on the upper level of the Caledonian Canal.

DIVISION XIX.—NORTHERN COUNTIES.

SCOURIE.—The greater part of January was open and mild; February and March were cold and boisterous, with occasional frost and S; April also was very cold, with some S and H and piercing N. and N.W. winds. May, June and July were exceptionally hot and dry, with little wind and almost no R. On hard ground grass and crops were burnt, but the rains in August saved the main crops. November and December were fresh and mild.

WATTEN H.R.S.—Fresh and open in the early months of the year; a wet cold spring; a dry, bright and hot summer, and a dull, mild, calm autumn.

IRELAND.

DIVISION XX.—MUNSTER.

CORK.—Remarkable for a R 9.50 in. less than the average of 17 years. The fall of S was insignificant, being about 2 inches for the

whole year on three days, January 9th, February 2nd and November 22nd. Absolute drought lasted for 16 days, ending July 7th, and partial drought for 44 days, ending July 18th, with 0·26 in. of R.

DERRY CASTLE.—R 4 in. below the average of ten years. January harsh at first, but very mild during the latter half ; February stormy and very harsh. Unusually favourable weather from the second week in March to the third week of April. May, June and July, were all gloriously fine ; August was the wettest month of the year, and on the 19th, 2·65 in. of R fell, the largest amount in 24 hours recorded in Killaloe or its vicinity, from 1846 to the present time. September dry, but dull and sunless ; October wet ; November remarkably mild and dry ; December also mild, but damp and foggy.

MILTOWN MALBAY.—A cold ungenial, half dry spring ; May blustery, rainy and cold ; June and July dry and warm ; August wet, and the harvest weather generally moist and broken. October cold and rainy, and the winter months moist and exceptionally mild.

DIVISION XXI.—LEINSTER.

LONGRAIGUE.—R 9·41 in. below the average of 20 years, and the smallest in any year during that period excepting 1887.

ABBEE LEIX, BLANDSFORT.—R 3·21 in. below the average of 15 years.

DUBLIN, FITZWILLIAM SQUARE.—R ·40 in. in defect of the average of 23 years ; number of rainy days also slightly deficient. In the third quarter of the year 9·36 in., or more than one-third of the total fell, 5·75 in. being recorded in August.

DUBLIN, PHOENIX PARK.—R ·79 in. below the average of ten years.

BALBRIGGAN, LARAGH.—R 4·55 in. less than the average of 21 years.

TRIM.—The year commenced with hard frost, followed by heavy R on January 11th, causing extensive floods ; the remainder of the month was fine. February was changeable, frost, S and R alternately. March and April were rather fine. The latter half of May, June, and half July were very dry. August was wet, September dry, and October wet again, the beginning of November was dry, and December had a fair share of R.

ATHLONE, TWYFORD.—A comparatively dry year, excepting August and October.

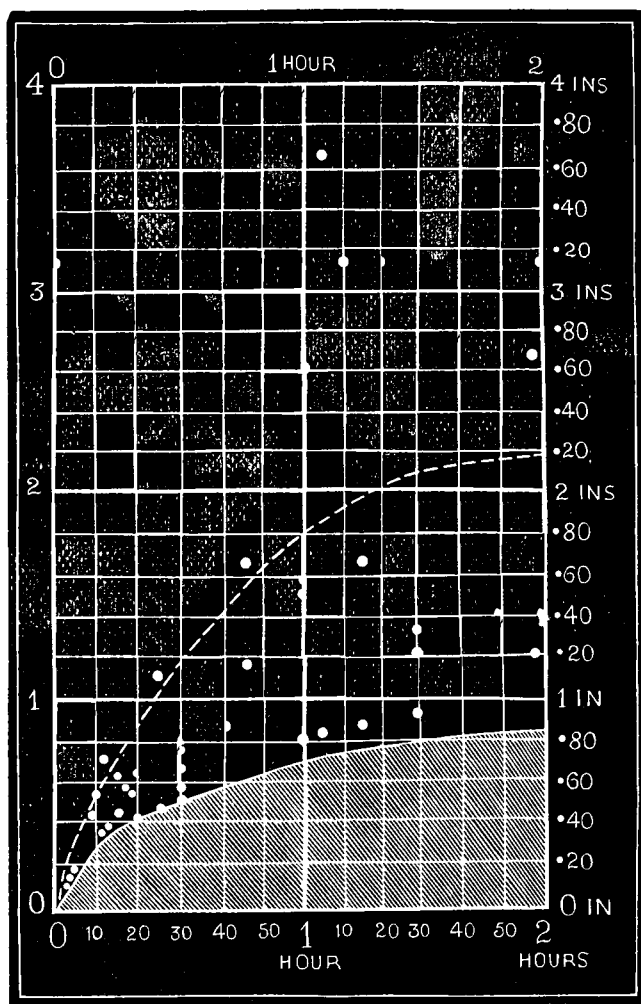
DIVISION XXIII.—ULSTER.

RAPHOE, CONVOY HOUSE.—A year of generally low temp. but no exceptional severity. The R was considerable except in June ($\cdot 60$ in.) which was the driest month recorded, while July and August were the wettest.

Dr. A. Buchan

HEAVY RAINS IN SHORT PERIODS IN 1889.

THIS part of our report is decidedly improving. The list is much longer than it used to be, and this because observers are being more careful, not because there was in 1889, as in 1888, an exceptional prevalence of rains of high intensity. There is no case in 1889 wherein the rate of fall per hour was even half of what Mr. Lowe reported in 1888, viz., that of 9.90 in. per hour. The highest rate of 1889 was only 3.37 in., and that rate was only for $12\frac{1}{2}$ minutes, but immediately following it is a R at Barrells, Henley-in-Arden, Warwickshire, of almost the same intensity (3.36 in.), lasting for



Date.	Div.	Station.	Amount.	Duration.	Rate per hour.
			in.	hr. min.	in.
June 2 ...	XVII.	Fettercairn, Arnhall	1·17	... 45 ?	1·56 ?
July 24 ...	IX.	Thixendale	1·40	... 50	1·68
June 7 ...	II.	Tunbridge, Ferndale	2·60 ?	1 0 ?	2·60 ?*
May 6 ...	II.	Compton [Petersfield] ..	1·55	1 0	1·55
June 7 ...	II.	Kingsclere, Ramsdale	1·50	1 0	1·50
" " ...	III.	Buntingford, Hamels Park ...	1·05	1 0	1·05
Aug. 10 ...	IV.	Bylaugh Park	1·02	1 0	1·02
May 23 ...	VII.	Ketton Hall [Stamford].....	1·01	1 0	1·01
July 12 ...	III.	St. Neots, Tetworth Hall.....	1·00	1 0	1·00
May 24 ...	VI.	Bewdley, Winterdyne Gardens	·80	1 0	·80
July 13 ...	VI.	Henley-in-Arden, Barrells ...	3·64	1 5	3·36*
June 9 ...	VIII.	St. Michael's-on-Wyre	·82	1 5	·76
July 12 ...	III.	Luton	3·16	1 10	2·71*
Sep. 7 ...	IX.	Holmfirth, Yateholme	1·65	1 15	1·32
July 12 ...	VI.	West Bromwich ..	·87	1 15	·70
June 7 ...	IV.	Lynn, Aylmer Hall ...	1·31	1 30	·87
July 12 ...	III.	Biggleswade, Langford	1·20	1 30	·80
June 6 ...	XVI.	Pittenweem, The Priory	·94	1 30	·63
May 23 ...	I.	Upper Clapton, Warwick Rd.	2·65-	2 0 ?	1·33 ?
July 13 ...	V.	Teignmouth, Marine Villa ...	1·20	2 0	·60
" " ...	IV.	Sudbury, Assington	2·40	2 10	1·11
" " ...	V.	Teignmouth, Woodway.....	1·75	2 30	·70
May 6 ...	V.	Bradford-on-Avon	1·72	2 30	·69
Aug. 7 ...	IX.	Hawes Junction	4·00 ?	3 0	1·33 ?
July 13 ...	VI.	Stroud, Upfield	1·48	3 0	·49
May 5 ...	VI.	Uttoxeter, Brook House	1·39	3 0	·46
Sep. 2 ...	IV.	Ilford, Great Gearies	1·32	3 0 ?	·44 ?
July 12 ...	V.	Bishops Cannings	1·30 ?	3 0	·43 ?
" 13 ...	VI.	Ludlow, Broomfield	2·85	7 15	·39
Sep. 2 ...	IV.	Romford, North Ockendon ...	4·45	8 15	·54
July 12 ...	III.	Buntingford, Hamels Park ...	2·35	9 0	·26
" 13 ...	IV.	Norwich, Blofield	2·32	10 0	·23
" 12 ...	III.	Bennington Lodge	2·51	11 0	·23
Sep. 23 ...	XI	Llanfrechfa Grange	2·17	11 0	·20
July 12 ...	II.	Hitchin	2·10	12 0	·18

HEAVY FALLS IN 24 HOURS IN 1889.

INTRODUCTORY.

THIS section always serves one purpose for which it was not intended—it invariably convicts some of my correspondents of not attending to Rule IX., and of setting the rain down to the day on which they measured it, instead of, as they should, to the day before.

It is also desirable to point out here, that the figures to be quoted in this section all refer to a period of 24 hours ending at 9 a.m. on the day following that upon which they are entered.

Further, in order to prevent this section being too long, it is necessary each year to examine the data and to resolve on the limit, below which it would be waste of time and of money to set out the falls *in extenso*. Unfortunately the fall in different years varies so much, that no uniform rule seems practicable; usually we have taken all falls exceeding 2 inches or exceeding 6 per cent.; but this year, there are nearly 500 such entries; we have therefore raised the limits and shall quote no falls unless they exceeded $2\frac{1}{2}$ inches, or exceeded 8 per cent.

CHRONICLE.

JANUARY 15TH.

This fall was only noticeable in the West of Ireland and not extremely so there.

XX. Kenmare (Derreen) 3·09 in. or 5·0 per cent.

MARCH 4TH.

A Cornwall rain, but not exceptional.

V. St. Austell (Trevarna) 2·51 in. or 5·8 per cent.

MARCH 8TH.

This may be called a Gloucestershire rain, because it yielded the M (*i.e.* Max. fall on any day in the year), at most stations in Gloucestershire, yet, oddly enough, at no one of them was the fall or the percentage large enough for a Gloucestershire entry to find place in the following table; moreover, it yielded M at stations extending

from South Wales to the Humber. The most remarkable records are :—

V.	Wiveliscombe (Willett Ho.)	2·63 in.	or 8·2 per cent.
„	Bridgewater (Ashford).....	2·45 „	8·5 „
„	Yatton (Chelvey)	2·66 „	9·5 „
VI.	Great Malvern (Malvernbury)	2·48 „	9·7 „
VII.	Derby (Etwall)	2·06 „	8·6 „

MARCH 24TH.

A heavy fall in N. Lancashire, but not an exceptional one.

VIII.	Broughton-in-Furness (Cockley Beck)	3·68 in.	or 4·7 per cent.
-------	-------------------------------------	----------	------------------

APRIL 8TH.

Not a very heavy fall, but in two districts, Herefordshire and the N.E. of Ireland, it exceeded our limits.

VI.	Kington (Lynhales)	2·56 in.	or 8·2 per cent.
XXI.	Ravensdale School.....	2·88 „	6·2 „
XXIII.	Lough Island Reavy	2·70 „	6·0 „

MAY 23RD.

A local thunderstorm in the N.E. of London.

I.	Upper Clapton (Warwick Road) ...	2·65 in.	or 9·1 per cent.
„	„ „ (Hadham Ho.)	2·07 „	8·0 „

MAY 26TH.

This was an important rain, yielding M at nearly 300 stations, extending from the Isle of Wight to Grantham, and from Wiltshire to London.

I.	Sunbury (Hanworth Road)	1·86 in.	or 9·0 per cent.
„	Staines	1·96 „	9·2 „
„	„ (Knowle Green).....	2·08 „	10·3 „
II.	Guildford (Wern)	1·86 „	8·5 „
„	Cobham (Leigh Hill Ho.).....	1·82 „	8·4 „
„	Chertsey (Ottershaw)	1·73 „	8·4 „
„	Weybridge Heath (Netherfield).....	1·78 „	8·5 „
„	„ „ (St. George's Lodge)	1·80 „	8·3 „
„	Esher Sewage Works	1·52 „	8·2 „
„	Old Windsor (The Ham)	1·75 „	8·4 „
III.	St. Albans (Gorhambury)	2·25 „	8·4 „
„	Slough (Langley)	1·95 „	9·3 „
V.	Salisbury (West Dean).....	2·46 „	10·4 „

JUNE 7TH.

Thunderstorm rains, one at Tunbridge Wells and one in Dorset, are represented below. A third in Hertfordshire was less remarkable.

II.	Tunbridge Wells (Ferndale)	2·60 in.	or 7·9 per cent.
V.	Salisbury (Landford).....	2·33 „	8·9 „
„	Maiden Newton (Cattistock Lodge)	3·84 „	10·1 „

JULY 9TH.

A local R in the N.E. of Ireland.

XXIII. Newcastle (Fairleigh) 2·88 in. or 5·8 per cent.

JULY 12TH.

The great Hertfordshire R, when several observers allowed their gauges to run over.

III.	St. Albans (The Grange)	2·95 in.	or 10·2 per cent.
"	" (Torrington House)	2·54 "	9·0 "
"	Hertford (Bayfordbury)	3·07 "	11·0 "
"	Harpden (Rothamstead)	3·06 "	10·5 "
"	Welwyn (Brocket Hall) ..	3·02 "	10·7 "
"	Ware (Red House)	3·27 "	12·4 "
"	" (Fanhams Hall)	3·50 "	12·8 "
"	Hertford (Marden Hill, Tewin)	3·91 "	12·8 "
"	Welwyn (Danesbury)	3·85 "	12·7 "
"	" (Datchworth)	3·02 "	11·8 "
"	Ware (Much Hadham)	2·76 "	10·2 "
"	Kensworth [Dunstable]	2·55 "	8·3 "
"	Bennington Lodge	2·51 "	8·6 "
"	Buntingford (Hamels Park)	2·35 "	8·7 "
"	Hitchin (Wratten)	2·10 "	8·5 "
"	" (Fairfield)	1·91 "	7·5 "
"	" (The Maples)	1·91 "	8·4 "
"	" (Bancroft) ..	2·08 "	8·2 "
"	" (High Down)	3·76 "	13·4 "
"	Buntingford (Throcking Rectory) ...	2·60 "	10·2 "
"	Royston	2·07 "	8·5 "
"	St. Neots (Tetworth Hall)	2·50 "	8·4 "
"	Luton	3·71 "	12·6 "
"	Biggleswade (Langford)	2·30 "	9·1 "
"	Sandy Rectory	2·20 "	8·4 "
"	Cambridge (Fulbourne Asylum)	2·40 "	8·1 "
"	" (W. W. Cherryhinton) ..	2·34 "	9·3 "
"	" (Beech House)	2·35 "	8·8 "
"	" (Sidney Street)	2·48 "	9·9 "
"	" Observatory	2·22 "	8·3 "
"	Ely (Stretham Ferry)	2·28 "	8·2 "
"	Chatteris (Horseway Lock)	1·86 "	8·7 "

JULY 13TH.

We have a few M in Norfolk (probably the storm of July 12th passing off), but the most remarkable were in the West Midland Counties.

IV.	Sudbury (Assington)	2·51 in.	or 9·2 per cent.
"	Norwich (Blofield)	2·57 "	8·6 "
VI.	Stroud (Upfield)	2·38 "	8·4 "
"	Ludlow (Ashford)	2·22 "	8·0 "
"	" (Bromfield)	2·96 "	9·7 "
"	" (Stanley Park) ..	2·52 "	8·7 "
"	Henley-in-Arden (Barrells)	3·82 "	11·7 "

AUGUST 7TH.

A heavy fall in the extreme N.W. of Yorkshire.

IX. Hawes Junction..... 4.16 in. or 7.5 per cent.

AUGUST 9TH.

Two local storms, one at Bath, the other on the E. of Scotland.

V.	Bath (St. John's)	3.01 in.	or 12.0 per cent.
XVI.	Dundee (Camperdown).. ..	2.52 „	10.6 „
„	Forest of Glen Tana	2.88 „	9.1 „

AUGUST 19TH.

In Ireland this was the most general M; it exceeded 2 in., or 6 per cent., at twenty stations, mostly in a tract of country extending N.E.-wards from Kerry to Antrim, but there was only one station at which the fall exceeded $2\frac{1}{2}$ in., and there was not one where it reached 8 per cent.

XX. Derrycastle [Killaloe] 2.65 in. or 6.3 per cent.

SEPTEMBER 2ND.

A heavy fall over the mouth of the Thames, and parts of the counties of Kent and Essex, on the south and north sides respectively. It was a very noteworthy fall for several reasons. Although it gave M exceeding 2 in., or 6 per cent., at only 16 stations, yet of these three are the highest percentages out of the whole 1,812 which have been tabulated for 1889. This is remarkable, though obviously a large fall in a dry district gives a high percentage, but not merely do they head the list, but they do so in a year when the percentages are unusually high, and they head it with amounts which have been exceeded by only two instances in 24 years, or, to put it still more clearly, only in two cases out of 25,992 which have been discussed in previous years. Another noteworthy fact with respect to these falls is that, though falling in a dry district, they are actually greater than any falls during 1889 at our wet stations, such as those in the English Lakes. Therefore, two out of the three falls on this day head both the list of heavy falls, and the list of greatest percentages. The exceptional features are even yet not exhausted. Hitherto I have never known a case of one of these exceptional rains (3 or 4 inches in a few hours at a dry station) occurring twice in the same district, the nearest approach to it being two falls in 1878 at Camden Square. However, in 1888, during the great Essex rain of August 1st, the North Ockendon gauge collected 4.56 in., and was allowed

to run over, and the Upminster Hall gauge collected 4·50 in., and was allowed to run over. And here we have one month and one day later in 1889 the same two stations with a strikingly analogous fall. Had there been but one such record it might have been feared that some mistake had been made, or some trick played upon the observer, but the two gauges are in private grounds, and two miles apart; their records are supported by the nearest Essex station, with a record of nearly 9 per cent., and immediately to the south on the other side of the Thames, we have Wilmington with very nearly as much R, and practically the same exceptional percentage as they have. It is not easy then to see any ground whatever for doubting the accuracy of these exceptional records.

II.	Dartford (Wilmington).....	3·90 in.	or 15·6 per cent.
IV.	Romford (N. Ockendon)	4·45 „	16·5 „
„	„ (Upminster Hall)	4·32 „	15·8 „
„	Brentwood (Sawyer's Hall)	2·40 „	8·7 „

SEPTEMBER 23RD.

A local fall in Monmouthshire and South Wales.

XI.	Chepstow (Shirenewton Hall).....	2·65 in.	or 8·2 per cent.
„	Llanelly (Cwm Ledi)	2·85 „	7·0 „

SEPTEMBER 26TH.

A heavy fall near the boundary between Lancashire and Yorkshire.

IX.	Slaidburn (Dunsop Houses).....	3·60 in.	or 6·1 per cent.
„	„ (Brennand)	3·71 „	5·6 „
„	„ (Whitendale)	3·94 „	5·6 „

OCTOBER 22ND.

The M chiefly in north-east Yorkshire and south Durham.

IX.	Guisborough (Hutton Hall).....	2·70 in.	or 8·4 per cent.
-----	--------------------------------	----------	------------------

NOVEMBER 1ST.

A heavy fall (but by no means unprecedented) in the N.W. of Scotland.

XVIII.	Glencarron Lodge	3·47 in.	or 4·4 per cent.
„	Lochbroom	2·75 „	6·3 „

DECEMBER 19TH.

The heaviest fall (but by no means a heavy one) in the English Lake district.

X.	Seathwaite	3·86 in.	or 3·6 per cent.
„	Wythburn Vicarage	2·54 „	3·3 „
„	Borrowdale Vicarage.. ..	2·69 „	3·6 „
„	Buttermere (Hassness).....	3·75 „	4·5 „
„	Borrowdale (Grange).....	2·53 „	3·9 „

ABSTRACT.

IN the previous section we called attention to the remarkable rains which head Tables I. and III., but nearly all the entries in those tables are exceptional. In Table I. there are about five entries which may be regarded as ordinary; Seathwaite, for instance, is tolerably sure of a place in the heaviest sixteen falls of the year; but to have in Table I. nine entries of more than 3·6 inches in twenty-four hours at stations with total yearly falls ranging from 27 to 38 inches is quite unusual.

This is also proved by Table II., whence we see that, although the wet stations have not contributed nearly the usual number of entries to Table I., yet the average fall is greater than usual, and that this is chiefly due to exceptional rains at dry stations is proved by the third column, which shows that the sixteen maximum falls quoted in Table I. yield an average percentage greater than those of any year back to the first compilation of the table in 1865—the mean being 9·9—or, in other words, that on the average one-tenth of the total year's rain fell in one day at each station.

This is further corroborated by Tables III. and IV., which show that as regards great rains at dry stations, 1889 has had no recent precedent. Prior to 1889, the highest average of the sixteen greatest percentages was 11·7 in 1884, when the rainfall was extremely small; in 1889, with a rainfall considerably greater, the maximum percentages are still higher (12·7). This is not so much due to a single high value pulling up the average* as it is to the large number of high percentages in the Hertfordshire storm on July 12th.

When, however, we come to deal in Table V. with the records from the whole of the country, this exceptional storm produces but a very faint influence. Torrential rains have not been exceptionally present, for the percentage for the 1,812 stations averages only 4·8, or 0·4 above the mean, and was equalled or exceeded in 1865, 1870, 1871, 1875, 1880, and 1884, and as regards actual fall, the mean amount, 1·41 inches, is rather below the average.

* Although the 16·5 per cent. (one-seventh of the year's total falling in one day) at North Ockendon, has but two precedents, in 1867 to 1870 respectively.

This general conclusion is further established by the following table :—

Year.	Total number of records.	Falls of 2·00in. or more.		Falls of 3·00in. or more.	
		Number.	Per cent. of total No.	Number.	Per cent. of total No.
1882	1463	140	9·6	8	0·6
1883	1505	170	11·3	23	1·5
1884	1691	138	8·2	9	0·5
1885	1801	179	10·0	24	1·3
1886	1718	158	9·2	44	2·6
1887	1921	52	2·7	4	0·2
1888	1974	374	18·9	34	1·7
Mean	1725	173	10·0	21	1·2
1889	1812	170	9·4	24	1·3
Diff.	+87	—3	—·6	+3	+·1

From this we see that there have been rather fewer falls of two inches and upwards than usual, less than half as many as in 1888, and that the falls of three inches and upwards have been almost precisely of the average number.

TABLE I.—*Maximum Falls in 1889.*

Date.	Div.	Station.	Depth.	Per Cent.	Fall in year.
Sep. 2 ...	IV.	Romford, North Ockendon...	4.45in.	16.5	26.94 in.
" " ...	"	Upminster Hall	4.32 "	15.8	27.36 "
Aug. 7 ...	IX.	Hawes Junction	4.16 "	7.5	55.49 "
Sept. 26 ...	IX.	Slaidburn, Whitendale	3.94 "	5.6	69.79 "
July 12 ...	III.	Hertford, Marden Hill, Tewin	3.91 "	12.8	30.53 "
Sep. 2 ...	II.	Dartford, Wilmington	3.90 "	15.6	24.98 "
Dec. 19 ...	X.	Seathwaite.....	3.86 "	3.6	106.24 "
July 12 ...	III.	Welwyn, Danesbury	3.85 "	12.7	30.36 "
June 7 ...	V.	Maiden Newton, Cattistock Lg	3.84 "	10.1	38.12 "
July 13 ...	VI.	Henley-in-Arden, Barrells ...	3.82 "	11.7	32.65 "
" 12 ...	III.	Hitchin, High Down	3.76 "	13.4	27.98 "
Dec. 19 ...	X.	Buttermere, Hassness	3.75 "	4.5	84.26 "
July 12 ...	III.	Luton.....	3.71 "	12.6	29.54 "
Sep. 26 ...	IX.	Slaidburn, Brennand	3.71 "	5.6	66.78 "
Mar. 24 ...	VIII.	Broughton, Cockley Beck ..	3.68 "	4.7	77.75 "
Sep. 26 ...	IX.	Slaidburn, Dunsop Houses...	3.60 "	6.1	59.06 "

TABLE II.—*Comparison of Maximum Falls with those in previous years.*

MEAN.				ABSOLUTE.			
Years.	Depth.	Per Cent.	Mean total fall at these stations.	Depth.	Per Cent.	Station.	Division.
	in.		in.	in.			
1865 ...	3.67	6.4	61.8	6.41	5.5	Seathwaite.....	X.
1866 ...	3.40	—4.4	86.2	6.38	3.6	Seathwaite.....	"
1867 ...	3.17	9.0	—42.5	4.78	+17.7	Hartlip	II.
1868 ...	3.32	6.1	65.9	5.60	4.8	Camusinas.....	XV.
1869 ...	3.68	5.0	77.7	6.70	4.5	Seathwaite.....	X.
1870 ...	3.20	7.5	43.8	6.00	17.1	Tongue	XIX.
1871 ...	3.08	5.7	61.6	4.24	9.6	Melbury.....	V.
1872 ...	4.10	6.6	73.1	5.82	3.2	Seathwaite.....	X.
1873 ...	2.97	6.2	60.7	4.20	—2.9	Seathwaite ...	"
1874 ...	3.96	4.6	86.5	5.32	4.4	Bryn Gwynant	XI.
1875 ...	+4.52	7.8	63.9	5.33	9.7	Newport W. W.	"
1876 ...	3.37	5.9	57.6	4.50	5.5	Foffany	XXIII.
1877 ...	3.77	4.6	+93.4	4.98	5.3	Skye, Portree..	XVIII.
1878 ...	3.57	7.4	57.2	4.24	8.6	Springfield ...	XI.
1879 ...	3.66	+9.5	50.4	—4.05	4.1	Little Langdale	X.
1880 ...	3.50	7.7	51.1	4.75	3.9	Seathwaite.....	"
1881 ...	3.65	4.9	83.1	5.42	4.7	Sligachan ...	XVIII.
1882 ...	3.28	4.5	84.3	4.51	3.0	Seathwaite ...	X.
1883 ...	3.69	6.1	72.4	5.27	9.0	Glenesmoel ...	XXI.
1884 ...	3.45	4.7	80.7	+6.78	5.0	Seathwaite ...	X.
1885 ...	3.45	5.8	68.2	4.62	3.2	Seathwaite ...	"
1886 ...	3.77	7.7	58.7	4.20	9.9	Little Bredy ...	V.
1887 ...	—2.83	6.1	56.8	4.93	13.0	Galway	XXII.
1888 ...	4.20	5.9	77.0	5.20	5.4	Wythburn Vic.	X.
Mean ...	3.55	6.3	67.3	5.18	6.8	.....	...
1889 ...	3.89	9.9	49.2	4.45	16.5	N. Ockendon..	IV.
Diff. ...	+ .34	+ 3.6	—18.1	— .73	+9.7	.....	...

TABLE III.—*Maximum Per Centages in 1889.*

Date.	Div.	Station.	Per Cent.	Depth.	Fall in year.
Sep. 2 ...	IV.	Romford, North Ockendon..	16·5	4·45 in.	26·94 in.
" " ...	"	Upminster Hall	15·8	4·32 "	27·36 "
" " ...	II.	Dartford, Wilmington	15·6	3·90 "	24·98 "
July 12 ...	III.	Hitchin, High Down	13·4	3·76 "	27·98 "
" " ...	"	Hertford, Marden Hill, Tewin	12·8	3·91 "	30·53 "
" " ...	"	Ware, Fanhams Hall	12·8	3·50 "	27·26 "
" " ...	"	Welwyn, Danesbury	12·7	3·85 "	30·36 "
" " ...	"	Luton.....	12·6	3·71 "	29·54 "
" " ...	"	Ware, Red House	12·4	3·27 "	26·38 "
Aug. 9 ...	V.	Bath, St. John Baptist Vic..	12·0	3·01 "	25·14 "
July 12 ...	III.	Welwyn, Datchworth Rect..	11·8	3·02 "	25·63 "
" 13 ...	VI.	Henley-in-Arden, Barrells...	11·7	3·82 "	32·65 "
" 12 ...	III.	Hertford, Bayfordbury	11·0	3·07 "	28·03 "
" " ...	"	Welwyn, Bocket Hall	10·7	3·02 "	28·25 "
Aug. 9 ...	XVI.	Dundee, Camperdown.....	10·6	2·52 "	23·78 "
July 12 ...	III.	Harpenden, Rothamstead ...	10·5	3·06 "	29·13 "

TABLE IV.—*Comparison of Maximum Per Centages with those in previous years.*

MEAN.				ABSOLUTE.			
Years.	Per Cent.	Depth.	Mean total fall at these Stations.	Per Cent.	Depth.	Station.	Division.
		in.	in.		in.		
1865 ...	9·9	2·62	28·4	13·0	4·40	Fleckney.....	VII.
1866 ...	8·1	2·31	29·3	10·0	—2·48	Burton	VI.
1867 ...	11·0	2·85	25·3	+17·7	4·78	Hartlip	II.
1868 ...	8·6	2·55	30·1	11·0	4·00	Tongue	XIX.
1869 ...	7·9	2·17	27·9	10·0	3·40	Tillydesk	XVII.
1870 ...	10·0	2·34	22·9	17·1	+6·00	Tongue	XIX.
1871 ...	9·0	2·43	26·8	11·5	3·62	Warter	IX.
1872 ...	8·1	3·43	+42·5	10·0	3·70	Hillington Hall	IV.
1873 ...	9·7	2·39	24·7	11·8	2·77	Oscott.....	VI.
1874 ...	9·2	2·16	23·7	11·9	2·50	Welwyn.. [Hall	III.
1875 ...	10·2	+3·76	37·5	13·2	3·95	Letheringsett ...	IV.
1876 ...	— 7·4	2·49	33·7	— 8·5	3·70	Craggside	X.
1877 ...	8·2	2·73	33·1	9·3	3·09	Wellington.....	VI.
1878 ...	10·2	3·05	30·0	11·8	3·90	Haverstock Hill	I.
1879 ...	10·9	3·31	30·5	12·3	3·80	Cambridge M. V.	III.
1880 ...	9·5	3·06	32·3	11·7	3·34	Marmont Pr. L.	"
1881 ...	8·1	2·42	30·3	10·6	3·20	Aboyne Castle..	XVII.
1882 ...	7·7	2·54	33·4	9·1	2·80	Bothalhaugh ...	X.
1883 ...	9·7	3·00	31·1	12·3	4·31	Skegness.....	VII.
1884 ...	+11·7	2·33	—20·0	13·8	2·66	Diss(Thelveton)	IV.
1885 ...	8·9	2·71	30·7	9·6	2·62	Beccles, Ellough	"
1886 ...	10·1	3·32	32·7	11·5	4·10	Methley Park...	IX.
1887 ...	9·5	—2·11	21·9	13·0	4·93	Galway	XXII.
1888 ...	10·9	3·05	28·3	11·8	3·24	Rothamstead ...	III.
Mean...	9·4	2·71	29·5	11·8	3·64	.....	...
1889 ...	12·7	3·51	27·8	16·5	4·45	N. Ockendon...	IV.
Diff. ...	+ 3·3	+ ·80	— 1·7	+ 4·7	+ ·81	.....	...

TABLE V.—*Comparison of the Mean of all the Maximum Falls of 1889 with similar data for previous years.*

Years.	Number of Returns.	Mean Percentage.	Mean Amount.	Mean Total Fall in year.	Ratio taking 34=100.	Total Fall being assumed =34in. Mean Max. =
			in.	in.		
1865.....	481	+ 5.1	1.70	33	97	5.0 per cent
1866.....	590	3.7	1.48	40	118	4.4 „
1867.....	584	4.6	1.44	31	91	4.2 „
1868.....	676	4.3	1.43	33	97	4.2 „
1869.....	637	4.2	1.42	34	100	4.2 „
1870.....	687	4.9	1.30	27	79	3.8 „
1871.....	752	4.9	1.49	30	88	4.4 „
1872.....	743	- 3.4	1.59	+ 47	+ 138	4.7 „
1873.....	809	4.6	1.35	29	85	4.0 „
1874.....	1010	4.4	1.41	32	94	4.1 „
1875.....	1081	5.0	+1.83	37	109	+5.4 „
1876.. ...	1112	3.9	1.49	38	112	4.4 „
1877.....	1180	3.8	1.56	41	121	4.6 „
1878.....	1186	4.3	1.49	35	103	4.4 „
1879.....	978	4.2	1.52	36	106	4.5 „
1880. ...	1117	4.8	1.72	36	106	5.1 „
1881.....	1194	4.1	1.45	35	103	4.3 „
1882.....	1463	3.6	1.42	39	115	4.2 „
1883.. ...	1505	4.0	1.41	35	103	4.1 „
1884.....	1691	4.8	1.32	28	82	3.9 „
1885.....	1801	4.5	1.41	31	91	4.2 „
1886.....	1718	4.6	1.64	35	103	4.8 „
1887.....	1921	4.5	-1.14	- 25	- 74	-3.4 „
1888.....	1974	4.4	1.41	32	94	4.1 „
Mean ...	1120	4.4	1.48	34	100	4.4 „
1889.....	1812	4.8	1.41	29	85	4.1 „
Diff.....	+692	+ 0.4	- .07	- 5	- 15	- .3 „

DROUGHTS IN 1889.

THE following list is drawn up on exactly the same principle as that in our last volume, and from almost precisely the same stations.

It will be remembered that the definitions are

ABSOLUTE DROUGHTS—Periods of *more than* 14 consecutive days absolutely without R.

PARTIAL DROUGHTS—Periods of *more than* 28 consecutive days, the aggregate rainfall of which does not exceed .01 in. per diem.

The principal feature in the table is seen at the first glance, viz., the widespread absolute and partial droughts which began about the middle of June* and lasted about a month. It was an absolute drought, lasting generally for three weeks, at 35 out of 50 stations, and at most of the others was broken only by quite trivial rains. The *absolute drought* was longest at Cargen, in Kirkcudbright, where no R fell between June 8th and July 9th, or for 30 clear days; and the *partial drought* was longest, viz., 45 days from June 3rd, at Portlaw, Co. Waterford. A drought of six and a half weeks, with only .27 in. of R in Co. Waterford, must surely be very rare.

Another *partial drought* prevailed at some stations in the west of England from the third week in August to the same date in September, and this covered an *absolute drought* of just over a fortnight, from the 3rd or 4th of September, over parts of western and central England.

In the S.E. of Scotland a dry period began on November 5th, and lasted from four to six weeks, but it was local, being reported only from the counties of Roxburgh and Edinburgh.

SUMMARY.

We showed last year (*British Rainfall*, 1888, p. [129]) that the droughts in 1888 were exceptionally few. We have only that year

* See also *Met. Mag.*, July, 1889, p. 87.

with which the results in the following table are strictly comparable, but for 1888 and for 1889 we have precisely corresponding data, and they show

ABSOLUTE DROUGHTS.						
	No. of stations.	Number.	Average.	Duration.	Greatest.	Stations without one.
1888	... 50	 17	 17 days	.....	20 days	 35
1889	... 50	 42	 21 „	.....	30 „	 13

PARTIAL DROUGHTS.						
	No. of stations.	Number.	Average.	Duration.	Greatest.	Stations without one.
1888	... 50	 4	 42 days	.....	50 days	 46
1889	... 50	 38	 34 „	.....	45 „	 15

STATION & COUNTY.	ABSOLUTE DROUGHTS.			PARTIAL DROUGHTS.			
	Began.	Ended.	Lasted.	Began.	Ended.	Lasted.	Amount.
London (Camden Square), N.W.. <i>Middlesex.</i>	June 16	July 7	22	None			in.
Dorking (Abinger Hall)	June 16	July 6	21	None			
<i>Surrey.</i>	Sept. 3	Sept. 18	16				
Hythe.....	June 11	July 6	26	None			
<i>Kent.</i>							
Welwyn (Datchworth Rectory).. <i>Herts.</i>	Sept. 3	Sept. 18	16	June 11	July 10	30	·18
Maxey Vic. [Market Deeping] ... <i>Northampton.</i>	Sept. 4	Sept. 18	15	May 30	July 8	40	·37
Geldeston [Beccles].....	June 11	July 6	26	None			
<i>Norfolk.</i>							
Calne (High Street)	June 16	July 7	22	Aug. 25	Sept. 22	29	·24
<i>Wilts.</i>							
Torquay (Babbacombe)	June 16	July 6	21	None			
<i>Devon.</i>							
Bideford (Northam).....	June 16	July 6	21	None			
<i>Devon.</i>	Sept. 4	Sept. 18	15				
St. Austell (Trevarna)	June 20	July 6	17	None			
<i>Cornwall.</i>							
Ilminster (White Lackington) ... <i>Somerset.</i>	June 16	July 6	21	None			
	Sept. 4	Sept. 18	15				
Ross (The Graig)	June 15	July 5	21	June 2	July 9	38	·38
<i>Hereford.</i>							

STATION & COUNTY.	ABSOLUTE DROUGHTS.			PARTIAL DROUGHTS.			
	Began.	Ended.	Lasted.	Began.	Ended.	Lasted.	Amount.
Weston Park [Shifnal] ... <i>Stafford.</i>	June 10	July 8	29	June 3	July 8	36	in. ·19
Market Overton <i>Rutland.</i>	None			June 10	July 9	30	·17
Worksop (Hodsock Priory) <i>Notts.</i>	None			June 10	July 8	29	·17
Chesterfield (Gas Works) <i>Derby</i>	June 11	July 8	28	June 10	July 9	30	·18
St. Michael's-on-Wyre <i>Lancashire.</i>	June 15	July 5	21	June 10	July 8	29	·17
Thornton-in-Craven <i>York W.R.</i>	June 14	July 5	22	June 3	July 9	37	·36
Cottingham <i>York E.R.</i>	June 21	July 6	16	June 1	July 8	38	·37
Darlington (South End) <i>Durham.</i>	June 10	July 5	26	June 1	July 8	38	·35
Morpeth (Bothalhaugh) <i>Northumberland.</i>	June 10	July 5	26	June 1	July 5	35	·31
Pawston [Coldstream]..... <i>Northumberland.</i>	None			June 3	July 5	33	·24
Blencowe School [Penrith] <i>Cumberland</i>	June 15	July 5	21	June 3	July 8	36	·34
Chepstow (Shirenewton Hall) ... <i>Monmouth</i>	June 15	July 5	21	June 2 Aug. 22	July 8 Sept. 22	37 32	·36 ·31
Haverfordwest (High Street)..... <i>Pembroke</i>	June 15	July 7	23	June 9	July 7	29	·16
Llanidloes (Broomcliffe) <i>Montgomery.</i>	June 15	July 6	22	June 2	July 7	36	·29
Halkyn <i>Flint.</i>	June 15	July 6	22	June 9	July 8	30	·30
Cerrig-y-druidion..... <i>Denbigh.</i>	June 16	July 5	20	June 10	July 8	29	·26
Garlieston (Galloway House)..... <i>Wigton.</i>	June 16	July 9	24	June 11	July 9	29	·09

STATION & COUNTY.	ABSOLUTE DROUGHTS.			PARTIAL DROUGHTS.			
	Began.	Ended.	Lasted.	Began.	Ended.	Lasted.	Amount.
Cargen [Dumfries] <i>Kirkcudbright.</i>	June 9	July 8	30	June 7	July	32	in. ·08
Melrose Asylum <i>Roxburgh.</i>	None			June 9 Nov. 5	July 8 Dec. 5	30 31	·20 ·23
Edinburgh (Blacket Place)..... <i>Edinburgh.</i>	June 15 Nov. 6	July 2 Nov. 21	18 16	June 9 Nov. 5	July 8 Dec. 18	30 44	·22 ·37
Old Cumnock <i>Ayr.</i>	None			None			
Killearn (Old Ballikinrain) <i>Stirling.</i>	June 15	July 6	22	June 10	July 8	29	·18
Strontian (Laudale)..... <i>Argyll.</i>	None			None			
Islay (Ardbeg) <i>Argyll.</i>	None			None			
Kirriemuir (Lintrathen) <i>Forfar.</i>	None			June 4	July 10	37	·27
Cromar (Logie Coldstone) <i>Aberdeen.</i>	June 15	June 30	16	None			
Alness (Ardross Castle) <i>Ross.</i>	None			None			
Golspie (Dunrobin Castle) <i>Sutherland.</i>	June 16	July 1	16	None			
Cork (Blackrock) <i>Cork.</i>	June 14	July 7	24	June 5	July 18	44	·40
Killarney (Woodlawn) <i>Kerry.</i>	None			June 4	July 12	39	·38
Portlaw (Mayfield) <i>Waterford.</i>	June 14	July 8	25	June 4	July 18	45	·27
Limerick (Kilcornan) <i>Limerick.</i>	June 14	July 12	29	June 3	July 12	40	·25
Bray (Fassaroe)..... <i>Wicklow.</i>	June 15	July 5	21	June 1	July 7	37	·32
Athlone (Twyford) <i>Westmeath.</i>	None			None			

STATION & COUNTY.	ABSOLUTE DROUGHTS.			PARTIAL DROUGHTS.			
	Began.	Ended.	Lasted.	Began.	Ended.	Lasted	Amount.
Ballinasloe (Garbally) <i>Galway.</i>	None			June 9	July 15	37	in. ·31
Collooney (Markree Observatory) <i>Sligo.</i>	None			June 15	July 13	29	·27
Belfast (Antrim Road) <i>Antrim.</i>	June 15	July 5	21	June 2	July 8	37	·37
Stewartstown (Ardrea Rectory) <i>Tyrone.</i>	June 15	July 5	21	June 1	July 7	37	·37

MONTHLY RAINFALL OF 1889.

We give, as usual, information on this subject in many forms.

In the *Meteorological Magazine* we give monthly abstracts of records from 150 stations, and for about 40 of them the difference between the fall in each month, and the average for the same month during the previous decade.

In the Observers' Notes on the Months (see pages [26] to [54]) we have given the general history of the weather; in the following tables (pages [88] to [94]) we give the monthly rainfall at each of about 230 stations, and in the two sheets of maps inserted between pages [94] and [95] we show in which part of the country the fall was near the average, and in which it was an inch or more above or below it.

These maps are similar to those given in previous years, and are based upon the following data:—A map was prepared showing the stations of which the records date back to 1870 and are still being continued; 48 stations were then chosen as widely distributed as possible; for each of them the mean rainfall was determined for each month, from the observations made during the decade, 1870-79. Then a table was constructed, showing for each station whether the fall in each month in 1889 was within one inch of the average, or more than an inch above or below it. Upon the map for each month were then placed marks over the site of each station, indicative of the relation of the fall in that month to the average. The symbols adopted were:—

A round dot when within an inch of the average.

A + when more than an inch above it.

And a — when more than an inch below it.

Lastly, we give on pages [95] to [97] a brief history of the distribution of the fall of rain over the British Isles in each month, and remarks on such monthly totals as have been exceptional.

MONTHLY RAINFALL AT 233 STATIONS IN THE BRITISH ISLES DURING 1889.

ENGLAND.

Div.	County.	Station.	Jan.	Feb.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.	Total.
I.	Middlesex	London (Camden Sq.)	.81	2.28	1.37	2.06	3.22	2.03	2.64	1.80	1.77	3.75	.89	1.23	23.85
II.	"	Pinner Hill	1.00	2.61	1.57	1.87	3.61	.95	1.88	2.34	1.68	2.99	1.09	1.25	22.84
"	Surrey	Guildford (Guildown)	1.27	2.64	2.42	2.57	2.84	1.06	1.78	2.19	1.04	5.24	1.04	1.64	25.73
"	Kent	Tenterden	.79	2.49	1.70	2.14	1.30	.91	2.11	2.84	2.80	7.62	1.24	1.47	27.41
"	"	Hythe	1.18	3.53	1.60	1.64	2.23	1.07	2.07	2.36	1.01	7.41	1.30	1.77	27.17
"	"	Sevenoaks (River Hill)	1.11	2.50	1.82	2.55	3.26	1.35	2.20	1.91	1.63	5.51	1.11	1.92	26.87
"	"	Ospringe (Lorenden)	.70	2.27	1.84	1.90	2.16	2.11	1.81	1.96	2.38	5.29	.64	1.53	24.59
"	Sussex	Worthing (Heene)	.93	2.27	1.65	2.33	1.31	1.30	2.74	2.58	.86	5.56	.93	1.46	23.92
"	"	Maresfield (Forest Lodge)	1.34	3.07	2.23	3.11	1.47	.26	3.25	3.25	1.20	6.92	1.49	2.21	29.80
"	Hants	I. of Wight (Sandown)	1.09	1.48	2.22	1.39	2.39	.17	1.89	2.20	.66	8.13	1.34	1.93	24.89
"	"	Bps. Waltham (Swanmore)	.99	2.31	2.40	1.95	2.67	.74	3.33	2.89	1.10	6.26	1.45	2.31	28.40
"	"	Basingstoke (Sherborne)	1.17	2.64	2.22	2.40	2.55	1.13	2.68	2.47	1.39	3.36	1.26	1.71	24.98
"	Berks	Newbury (Welford)	.94	2.62	2.32	2.79	2.83	1.93	4.33	2.63	1.32	3.22	1.15	1.87	27.95
III.	Herts	Hertford (Bayfordbury)	.90	1.84	1.64	1.58	3.34	3.22	4.90	1.70	2.37	3.81	.93	1.80	28.03
"	"	Royston	.95	1.80	1.23	2.44	3.46	2.47	2.89	1.54	2.05	3.80	.79	.99	24.41
"	"	Greenlands [Henley-on-Thames]	1.20	2.63	2.30	2.78	2.89	1.19	2.20	2.80	2.28	3.94	.59	2.27	27.07
"	Bucks	Buckingham (Adstock)	.96	1.91	2.07	2.86	3.35	1.81	2.64	2.18	2.41	3.23	.97	1.11	25.50
"	"	Oxford (Magdalen Coll.)	.66	1.82	1.69	2.51	2.91	1.90	2.69	2.29	1.49	2.36	.88	1.04	22.24
"	Northampton	Wellingborough (Swanspool)	1.15	2.19	1.99	2.63	3.56	.55	2.21	2.14	2.51	2.96	.90	1.32	24.11
"	Bedford	Bedford	1.05	1.87	1.67	2.55	4.56	1.20	2.87	1.25	2.75	2.67	.90	1.03	24.37
"	Cambridge.	Ely (Stretham)	.69	1.30	.71	2.30	4.56	1.21	4.45	2.42	4.73	3.44	1.02	1.14	27.97
IV.	"	Wisbech	.91	1.89	1.80	2.17	3.65	1.26	2.82	2.03	2.38	3.76	1.09	1.48	25.24
"	Essex	Epping (The Hemnalls)	1.26	2.04	2.44	2.07	4.65	3.14	2.59	3.13	3.53	4.95	1.47	2.19	33.46
"	"	Chelmsford (High Street)	.68	2.02	1.61	1.93	3.20	1.40	1.67	2.63	2.50	3.88	1.18	1.20	23.90
"	"	Braintree (Bocking Place)	.57	1.64	1.40	2.22	4.00	.95	3.39	2.43	2.12	3.78	1.28	1.16	24.94
"	Suffolk	Ipswich (Bishop's Hill)	.90	1.96	1.30	1.50	3.27	3.55	3.45	2.57	1.70	4.43	1.34	1.24	27.21
"	"	Haverhill (Great Thurlow)	.55	1.59	.59	2.67	4.08	1.65	3.22	2.29	2.78	3.13	1.35	1.36	25.26
"	"	Stradbroke Vic.	.63	1.49	1.32	2.07	3.05	2.38	2.44	2.27	2.39	4.16	1.40	1.25	24.85
"	"	Geldeston [Beccles]	.83	1.31	.83	2.31	2.69	1.71	2.22	2.66	3.48	3.77	1.19	1.11	24.11
"	Norfolk	Swaffham Grammar School	.74	1.65	1.10	2.15	2.72	1.86	2.19	4.30	2.76	2.76	1.43	1.66	25.32
"	"	Holt (Lethringsett Hall)	.86	1.73	1.17	2.17	2.57	1.16	3.64	3.32	2.66	3.36	1.67	1.55	25.86

ENGLAND—(continued.)

Div.	County.	Station.	Jan.	Feb.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.	Total.
V.	Wilts	Salisbury (Alderbury)	.71	1.65	2.11	2.16	2.03	2.26	2.41	1.96	1.16	3.74	1.12	2.15	23.46
"	"	Trowbridge (Steeple Ashton)	.60	1.46	2.23	3.25	2.09	2.74	2.48	3.14	1.11	2.84	1.15	1.61	24.70
"	"	Marlborough	.99	2.87	2.99	2.90	2.47	1.04	3.78	2.71	1.10	2.65	1.38	1.98	26.86
"	Dorset	Weymouth (Osmington) ..	1.06	2.05	1.97	2.05	1.12	2.22	2.17	3.42	1.19	5.35	1.69	2.87	27.16
"	"	Wimborne (Chalbury)	.73	1.61	2.79	2.93	1.27	2.20	2.58	2.09	1.05	5.19	1.15	2.30	25.89
"	"	Shaftesbury	.90	2.38	2.57	3.94	1.55	1.59	3.66	3.51	1.84	4.93	1.58	2.47	30.92
"	Devon	Brixham (Lupton)	.54	1.10	4.13	1.28	2.38	.72	3.15	2.89	1.75	5.57	2.03	2.57	28.11
"	"	Walkhampton (Lowery) (sin.) ..	2.44	3.90	6.32	4.11	3.17	.59	5.40	5.70	2.42	6.79	3.32	5.10	49.26
"	"	Ilminster (Middlecott Ho.) ..	1.71	4.09	7.08	1.85	2.53	.52	3.30	3.28	2.03	4.58	2.26	2.24	35.47
"	"	Cullompton	.92	3.20	2.99	2.74	2.86	.09	3.47	3.72	1.55	4.64	1.83	2.31	30.32
"	"	South Molton (Rose Ash) ..	1.30	4.90	3.96	2.10	3.00	.50	3.36	4.55	2.02	4.95	2.04	3.22	35.90
"	Cornwall	Penzance (Penlee)	3.24	4.03	4.69	2.56	2.97	.70	3.34	3.12	1.93	6.82	4.22	3.75	41.37
"	"	St. Agnes	2.41	3.17	3.64	2.16	3.74	.68	2.89	3.50	1.11	6.31	4.64	3.11	37.36
"	"	Bude	1.86	2.76	3.67	1.34	2.60	.18	2.90	2.14	1.61	4.03	1.51	3.21	27.81
"	"	Ilminster (White Lackington) ..	.83	1.67	3.61	3.29	2.39	1.00	3.00	2.83	1.21	4.28	1.27	2.16	27.54
"	Somerset	Glastonbury (Street)	.59	1.74	2.81	3.19	3.17	.91	3.61	2.59	1.37	3.13	1.07	2.24	26.42
"	"	Exford Rectory	1.97	3.61	4.45	3.45	3.64	.79	3.22	5.41	1.67	6.50	2.91	3.19	40.81
VI.	Gloucester	Clifton (South Parade) ..	.84	1.54	4.38	4.77	2.69	.51	4.43	3.33	2.27	2.26	1.22	2.25	30.49
"	"	Stroud (Upfield)	.80	1.58	4.80	4.69	3.11	.45	4.04	2.04	1.69	2.45	1.12	1.70	28.47
"	"	Fairford (Hatherop Rec.) ..	.78	1.96	2.81	2.93	2.93	.71	2.65	3.44	2.01	2.46	1.14	1.69	25.51
"	Hereford	Ross (The Graig)	.84	1.29	3.28	5.64	3.81	.41	2.27	2.23	2.06	3.77	1.09	1.22	27.91
"	Salop	Ch. Stretton (Woolstaston) ..	.66	1.27	2.37	5.75	3.24	.45	3.68	3.19	1.63	4.01	1.35	2.17	29.77
"	"	Much Wenlock (Willey Pk.) ..	.48	1.42	3.11	5.54	2.74	.48	2.57	2.99	2.42	3.61	.94	1.54	27.84
"	"	Oswestry (Hengoed)	.92	1.72	2.07	5.48	2.73	.74	2.22	2.18	1.50	3.66	1.71	2.04	26.97
"	"	Lichfield Museum	.83	2.52	3.02	3.58	3.85	.88	1.98	3.65	3.09	3.29	.88	2.26	29.83
"	Stafford	Burton (Shobnall)	.76	1.84	3.31	2.88	3.78	.69	2.26	3.00	2.34	2.56	.77	2.09	26.28
"	"	Etruria	.89	1.84	3.10	2.73	3.34	1.25	2.70	5.05	4.64	2.47	1.43	2.62	32.06
"	"	Blockley	.81	1.95	3.91	3.29	4.35	4.35	2.09	2.87	1.90	2.60	2.25	1.22	27.24
"	Worcester	Malvern (Hornvold Ter.) ..	.76	1.36	2.67	4.51	3.68	.38	3.16	3.26	1.65	3.20	1.29	2.03	27.95
"	"	Tenbury (Orleton)	.59	1.62	2.80	4.67	3.19	.66	2.22	2.61	1.49	3.21	1.02	1.83	25.91
"	"	Stourbridge (Longlands) ..	.69	1.89	2.84	4.93	4.70	1.97	2.58	3.61	2.42	4.13	1.72	2.62	34.10
"	Warwick	Leamington (Upper Parade) ..	.65	1.90	2.97	2.87	3.11	1.10	1.71	2.73	1.99	1.79	1.14	1.32	23.28
"	"	Atherstone	.88	1.78	4.14	2.84	2.94	1.09	1.71	2.88	2.79	2.87	.73	2.02	26.67
VII.	Leicester	Loughborough (Cedar Cott.) ..	1.34	1.88	4.33	3.96	4.00	.93	2.11	3.54	2.51	3.30	.81	2.08	30.79
"	"	Harston [Grantham]	1.70	1.79	2.76	2.33	5.53	.59	1.56	3.27	2.27	3.29	.52	1.27	26.88

ENGLAND—(continued.)

Div.	County.	Station.	Jan.	Feb.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.	Total.
VII.	Rutland	Market Overton	1.57	2.11	2.46	3.08	5.31	.39	1.93	2.83	2.13	3.49	.75	1.64	27.69
"	Lincoln	Horncastle (Queen Street).	1.39	4.01	2.64	2.99	3.56	.41	1.42	3.47	2.31	2.90	.75	.67	26.52
"	"	Brigg (Appleby Vic.)	1.27	1.39	2.64	1.94	5.22	.21	1.44	2.86	1.59	4.94	.50	1.43	25.43
"	Notts	Ollerton (Thoresby Gardens)	1.63	1.25	4.14	2.95	3.07	.75	1.57	2.82	1.82	3.63	.45	1.55	25.13
"	Derby	Buxton	2.73	3.56	4.35	3.52	3.93	.63	4.44	6.24	4.56	4.99	2.51	4.36	45.82
VIII.	Cheshire	Congleton (Buglawton Vic.)	1.03	1.57	3.65	2.86	3.17	.86	3.85	5.67	3.50	1.89	2.05	2.65	32.75
"	Lancashire	Manchester (Withington).	1.09	1.88	3.12	2.10	2.29	.59	3.09	5.70	2.52	2.91	2.04	2.23	29.56
"	"	Ormskirk (Rufford)	1.01	1.63	1.92	2.47	3.57	.57	2.55	4.50	2.95	2.44	1.87	3.30	28.78
"	"	Burnley (Swinden, Lower)	2.04	2.47	3.63	3.15	2.80	.88	3.68	6.02	3.12	5.45	2.04	3.20	38.48
"	"	St. Michael's-on-Wyre	1.57	2.30	2.10	2.16	3.41	1.37	2.56	5.05	3.22	4.04	1.99	3.23	33.00
"	"	Grange (Nutwood)	3.31	2.89	2.88	2.48	3.58	.89	3.20	5.26	3.19	4.81	1.90	4.14	38.53
IX.	York, W. R.	Rotherham (Moorgate Grove)	1.38	1.83	3.20	3.22	4.08	.54	1.20	2.60	1.75	3.21	.49	1.27	24.77
"	"	Huddersfield (Dalton)	1.35	1.81	3.17	3.99	3.36	.57	3.01	3.22	1.50	4.68	.90	1.94	29.50
"	"	Leeds (Methley Park)	1.22	1.24	3.02	3.21	4.25	.47	1.44	3.91	1.05	3.47	.84	1.82	25.94
"	"	Malham Tarn	3.77	3.74	6.44	3.24	2.87	.71	4.72	9.92	3.75	6.41	3.13	4.32	53.02
"	"	Ripon (Mickley)	.97	1.40	2.93	3.12	2.62	.35	2.46	4.11	.79	4.14	.79	1.34	25.02
"	York, E. R.	Pattingham	1.16	1.92	2.31	2.52	3.52	.13	1.70	3.45	1.31	3.86	1.02	1.25	24.15
"	"	Brantinghamthorpe	1.50	1.29	3.14	3.49	6.32	.38	.95	3.94	1.22	5.37	.41	1.49	29.50
"	"	Pocklington (Warter)	1.39	2.08	2.95	2.95	3.19	.50	1.74	4.58	1.16	4.42	1.05	1.58	27.59
"	York, N. R.	Malton	1.32	1.88	2.20	2.25	2.48	.34	1.74	3.89	.81	5.04	.74	1.29	23.98
"	"	Northallerton (The Lodge)	.98	.61	2.56	1.81	1.55	.39	2.29	4.10	.89	4.01	.92	1.65	21.76
"	"	Robin Hood's Bay	2.00	.53	4.69	2.94	3.18	.61	1.88	3.41	1.20	3.77	2.00	2.18	28.39
"	"	Lockwood Beck	1.83	2.65	3.22	3.05	2.22	.46	3.83	5.76	1.86	8.26	2.10	2.12	37.36
X.	Durham	Darlington (South End)	.92	1.10	2.77	2.32	2.33	.22	2.31	3.27	.54	4.37	1.11	1.46	22.72
"	"	Hartlepool (Hurworth Burn)	1.41	1.13	3.28	2.17	2.28	.31	2.44	2.68	.82	5.40	1.10	1.21	24.23
"	"	Wolsingham	.88	1.81	3.53	3.93	1.63	.21	3.10	3.38	.68	5.98	1.16	1.02	27.31
"	Northumberland	Haltwhistle (Unthank Hall)	1.29	2.25	2.62	2.88	1.38	.83	4.28	5.19	1.82	3.80	1.21	2.14	29.69
"	"	Morpeth (Meldon Park)	1.02	1.38	2.70	4.10	1.80	.34	3.48	3.15	1.97	5.33	.68	1.02	26.54
"	"	Alwinton (Biddleston)	1.40	2.07	3.79	5.59	1.21	.90	3.25	4.49	1.94	5.55	.63	1.55	32.40
"	"	Howick Hall	1.27	1.01	2.42	2.63	2.46	.58	3.06	3.74	1.66	3.96	.59	2.00	25.38
"	Cumberland	Borrowdale (Seathwaite)	12.36	9.53	8.88	5.64	5.79	1.11	5.78	11.92	8.31	13.77	6.82	16.33	106.24
"	"	Brampton (Denton House)	1.38	1.85	2.75	2.56	1.72	.76	2.82	5.66	2.40	4.97	1.21	2.25	30.33
"	Westmoreland	Kendal (Kent Terrace)	4.74	3.62	3.37	2.10	4.00	.79	3.57	5.09	2.23	6.00	3.18	4.46	43.15
"	"	Kirkby Stephen	1.53	1.59	1.51	2.35	2.27	1.06	3.14	4.79	1.24	5.31	1.59	2.87	29.25
"	"	Lowther Castle	4.58	1.12	1.55	2.39	3.19	1.12	2.45	4.10	1.77	5.37	1.91	2.95	32.50

MONMOUTH, WALES AND THE ISLANDS.

Div.	County.	Station.	Jan.	Feb.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.	Total.
XI.	Monmouth	Chepstow (Shirenewton Hall)	1.79	1.25	4.76	4.52	3.06	.49	3.09	3.84	3.24	3.13	1.29	1.96	32.42
"	"	Abergavenny	1.11	1.67	3.32	4.65	3.44	.62	5.44	2.33	1.57	3.38	1.55	1.33	30.41
"	Glamorgan	Cardiff Castle	1.54	1.90	3.50	3.42	2.61	.53	4.21	3.86	2.19	3.50	1.84	2.42	31.52
"	"	Ystalyfera (Tan-yr-allt) ...	2.62	3.78	2.78	2.02	3.91	.47	4.47	6.40	2.02	6.31	3.47	5.23	43.48
"	Cardmarthen	Cardmarthen Asylum	2.39	2.87	3.36	2.21	3.32	.85	3.73	3.78	3.00	5.59	3.51	4.01	38.62
"	"	Llandoverly	3.05	4.02	3.66	3.68	3.91	.73	3.50	4.19	2.82	5.31	2.52	3.64	41.03
"	Pembroke	Stackpole Court	1.80	3.28	2.63	1.69	2.96	.50	2.78	3.44	2.16	4.52	3.96	3.25	32.97
"	Cardigan	Troedyaaur Rectory	1.68	2.70	2.92	2.40	3.60	.85	2.48	3.47	2.77	5.67	2.42	3.35	34.31
"	"	Aberystwith (Cwmsymlog)	3.35	4.50	5.23	5.16	3.48	.48	4.24	7.43	4.18	7.94	3.43	5.00	54.42
"	Brecknock	Brecknock (Cantref Rec.)	2.48	3.84	3.97	4.58	4.59	.40	3.54	4.78	1.88	4.78	2.40	2.81	40.05
"	"	Newbridge (Llysdinam)	1.06	2.22	2.74	4.72	2.10	.33	3.28	4.22	3.17	7.28	1.65	2.35	29.90
"	"	Rhayader (Nantgwillt)	2.65	5.67	4.82	6.36	4.10	.99	5.35	6.32	2.05	3.18	2.62	4.25	53.58
"	"	Carno (Tybrith)	2.18	3.03	3.96	4.69	3.91	.46	3.82	5.32	2.60	6.21	2.46	3.50	42.14
"	Montgomery	St Asaph (Nantllys)	.63	1.60	2.47	3.82	2.07	.27	2.52	4.24	2.56	4.29	2.30	2.15	28.92
"	Flint	Rosset (Trevalyn Hall)	.45	1.53	2.28	3.12	1.89	.60	2.88	2.72	2.24	2.87	1.82	2.02	24.42
"	Denbigh	Trawsfynydd	3.55	3.73	3.30	5.62	3.70	.31	2.71	7.59	3.70	6.07	2.88	4.41	47.57
"	Merioneth	Corwen (Rhug Gardens)	1.53	1.65	2.29	4.93	3.89	.66	1.90	3.36	1.63	5.62	2.04	1.97	31.47
"	"	Port Madoc	2.64	4.44	4.04	4.35	2.27	.57	3.27	6.72	2.97	4.93	3.67	7.20	47.07
"	Anglesey	Llanerchymedd (Llwydiarth)	.98	2.13	1.39	4.57	1.91	.80	1.76	3.76	2.65	4.08	2.20	3.95	30.17
"	Isle of Man	Douglas (Victoria Road)	2.46	3.08	2.36	3.52	2.67	.36	2.53	5.32	2.78	3.77	2.67	3.54	35.06
"	Jersey	St. Aubins (Noirmont)	1.33	2.87	1.49	1.63	1.54	3.50	2.39	2.63	.86	8.24	2.49	3.27	32.24
"	Guernsey	Les Ruettes Brayes	1.28	3.36	2.05	1.75	2.23	1.78	2.32	2.72	.95	8.92	2.37	3.47	33.20

SCOTLAND.

XII.	Wigton	Garliestown (Galloway House)	2.12	2.80	2.69	1.66	2.77	1.23	3.93	3.81	3.20	2.48	2.66	2.83	32.18
"	"	Corsewall	3.00	2.01	1.42	1.92	1.39	.77	.85	3.59	2.21	1.73	2.43	2.29	23.61
"	Kirkcudbright	Dalbeattie (Colvend Manse)	3.50	2.52	2.74	2.07	2.74	1.68	2.70	4.18	2.28	4.26	2.80	2.75	34.22
"	"	New Galloway (Glenlee)	4.55	4.01	3.25	3.30	4.37	.85	5.06	5.37	2.07	5.71	4.26	6.81	49.61
"	Dumfries	Moffat (Ericstane)	3.40	2.80	2.80	2.40	3.05	1.40	3.30	4.50	2.10	6.00	2.35	7.80	41.90
"	Roxburgh	New Castleton (The Flatt)	3.60	2.80	3.50	2.30	2.80	.60	4.00	4.20	2.10	6.20	1.70	3.60	37.40
"	"	Hawick (Braxholme)	1.54	2.24	3.44	2.74	1.36	1.06	3.95	3.92	1.41	5.11	1.05	2.29	30.11
"	"	Jedburgh	.54	1.36	2.83	2.55	1.55	.34	3.86	4.54	1.38	4.74	.64	1.54	25.87
XIII.	Peebles	Glenrath	1.76	3.47	2.05	3.35	1.47	.85	3.18	2.78	2.09	6.47	1.07	4.27	32.81
"	"	N. Esk Res. [Penicuik]	1.30	2.00	2.45	3.40	2.45	1.50	4.30	7.10	1.50	4.45	1.00	3.40	34.85

SCOTLAND—(continued.)

Div.	County.	Station.	Jan.	Feb.	March.	April	May	June.	July.	August.	Sept.	Oct.	Nov.	Dec.	Total.
XIII.	Berwick	Marchmont House	.82	2.37	2.96	4.44	2.20	.86	4.87	4.32	1.56	5.70	.77	1.50	32.37
	Haddington	East Linton	.40	1.00	.87	2.78	1.90	1.03	4.38	4.92	.69	5.16	.43	.57	24.13
	Edinburgh	Fdinburgh (Charlotte Sq.)	.60	.80	.60	2.50	1.80	1.25	3.66	5.05	.80	3.40	.65	1.20	22.31
	Linlithgow	Uphall	.91	.39	1.06	2.64	1.81	1.01	2.82	7.75	.97	3.10	.64	2.05	25.15
XIV.	Lanark	Biggar (Cambus Wallace)	1.60	2.10	1.60	1.53	1.96	1.29	3.60	4.92	1.61	3.50	1.18	3.12	28.01
	"	Cambuslang	1.54	1.86	1.02	1.80	3.26	.91	2.34	4.41	1.38	2.80	1.66	2.81	25.79
	"	Colmonell	4.17	3.50	2.89	2.42	3.08	.83	3.03	5.33	3.01	4.29	3.15	5.29	40.99
	Ayr	Ayr (Auchinlee)	2.45	2.58	1.40	1.96	3.35	.63	2.52	3.91	2.84	3.47	1.77	3.95	30.83
XV.	"	Kilmarnock (North Craig)	2.62	2.48	1.60	1.69	2.25	.32	3.15	4.95	2.35	4.31	2.59	3.76	32.07
	"	Arrochar	8.85	5.70	4.65	3.85	5.95	2.65	.85	4.05	2.00	4.15	5.95	8.35	57.00
	Dumbarton	Killearn	5.43	4.05	2.02	4.19	4.91	1.66	1.89	5.38	1.45	4.71	2.16	4.69	42.54
	Stirling	Arran (Pladda)	4.54	4.12	2.78	2.31	2.01	1.29	2.32	6.07	3.01	2.30	1.95	2.85	35.55
" "	Bute	Holy Loch (Rosmor)	8.19	5.40	3.55	4.42	4.24	1.81	2.14	7.66	3.16	6.09	4.82	8.47	59.95
	Argyll	Lochgilphhead (Kilmory)	8.47	4.81	2.78	3.28	3.04	1.44	.92	5.82	3.59	5.56	4.09	7.96	51.76
	"	Appin (Airds)	5.69	3.32	4.47	1.68	3.71	1.40	1.47	6.28	2.83	3.60	3.45	8.20	46.10
	"	Strontian (Laudale)	9.59	6.49	5.14	3.45	4.35	1.75	1.55	7.10	3.70	5.22	6.32	11.74	66.40
" "	"	Cantire (Devaar)	4.04	3.44	1.55	2.33	1.00	.57	2.82	4.90	2.67	4.47	3.46	5.56	36.81
	"	Islay (Eallabus)	5.48	3.89	2.88	2.51	1.76	.97	1.75	6.01	3.14	5.69	3.63	6.46	44.17
	"	Jura (Fladda)	8.20	4.75	2.95	2.80	3.50	1.30	1.75	5.85	3.65	5.35	5.10	9.60	54.80
	"	Tyre (Hynish)	4.04	2.13	4.28	3.16	3.36	.40	2.36	5.00	2.53	3.80	5.45	6.38	42.89
XVI.	Clackmannan	Tillicoultry House	1.41	1.91	1.44	3.55	4.21	.85	2.25	5.34	1.40	4.04	1.55	2.55	30.50
	Fife	Kilconquhar (Balcarres)	1.10	1.50	1.10	4.75	2.80	1.13	3.52	6.36	.76	3.23	.70	1.35	28.30
	"	Strathmiglo (Loden Urquht)	1.54	1.45	.92	4.85	3.16	1.06	2.68	5.86	.69	4.03	1.22	1.90	29.36
	"	Stronvar	7.30	4.73	2.77	4.90	5.02	1.56	1.78	6.16	1.57	6.11	3.31	8.03	53.24
" "	Perth	Dunkeld (Inver Braan)	2.46	1.30	1.59	4.41	3.20	.56	3.67	5.77	.77	4.49	.95	5.86	50.21
	"	Dalnaspidal H.R.S.	4.84	5.37	3.22	5.31	3.49	1.13	2.73	7.81	1.93	5.53	2.99	5.86	50.21
	"	Dundee (Broughty Ferry)	1.00	1.19	1.30	3.89	1.45	.76	2.55	5.92	.50	2.39	.69	1.01	22.65
	Forfar	Kirriemuir (Lintrathen)	1.90	2.00	1.49	3.84	3.37	1.12	2.08	7.32	.82	2.32	.81	2.33	30.40
XVII.	"	The Burn	1.40	2.40	1.70	5.40	1.20	1.30	2.10	7.20	.40	3.50	.80	1.60	29.00
	Kincardine	Coldstone Manse	.71	4.12	1.54	4.69	.63	.91	2.50	5.86	1.08	2.47	2.11	1.51	28.13
	Aberdeen	Haddo House	1.13	3.69	2.91	3.16	1.32	.62	3.95	4.85	1.42	3.23	2.18	1.78	30.24
	"	Old Deer	1.13	3.40	2.23	3.30	1.00	.53	4.62	3.84	2.07	3.51	2.53	2.02	30.18
" "	Moray	Grantown	1.55	4.67	1.59	2.59	.29	.43	3.07	5.06	1.51	2.39	2.60	1.57	27.32
	"	Gordon Castle	.85	3.25	1.66	2.99	.81	.64	3.37	4.49	1.47	3.17	2.34	1.58	26.62
	"	Elgin	.66	3.00	1.64	2.71	.35	.47	1.37	4.45	1.36	3.12	1.97	1.54	23.14

SCOTLAND—(continued.)

Div.	County.	Station.	Jan.	Feb.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.	Total.
XVIII.	Ross	Strome Ferry H.R.S.	5.85	5.12	6.22	2.21	2.19	.76	1.07	6.83	4.31	3.81	4.96	8.50	51.83
"	"	Strathconan	3.43	5.75	3.86	3.10	1.67	1.07	2.81	7.38	2.73	1.25	3.56	3.06	39.67
"	"	Braemore House	1.99	9.34	5.41	2.18	2.19	.84	1.90	5.36	4.70	4.05	8.15	6.00	52.11
"	"	Adross Castle	1.38	4.34	1.42	3.47	1.31	1.24	1.50	6.01	1.50	3.95	2.54	2.27	30.93
"	Inverness	Fort William	10.24	9.12	6.23	2.85	2.88	1.00	1.35	7.61	3.91	4.11	5.12	10.56	64.98
"	"	N. Uist (Loch Maddy)	4.73	3.24	3.33	1.79	2.40	1.35	.72	5.33	4.07	3.82	3.12	7.78	41.68
"	"	Invergarry	6.49	4.49	4.14	3.78	1.39	.30	1.24	5.35	2.59	2.91	4.88	7.55	45.11
"	"	Aviemore H.R.S.	1.13	4.50	1.09	1.49	.59	.64	2.10	5.31	1.14	2.31	2.15	2.05	24.50
"	"	Inverness H.R.S.	.54	3.38	2.06	2.10	.72	.22	1.30	2.60	.74	1.24	1.48	.98	17.36
XIX.	"	Invershin	.76	2.16	3.42	2.37	1.05	.27	1.24	3.97	2.79	3.87	1.06	2.09	25.05
"	"	Scourie	5.24	4.89	3.69	2.05	1.13	.94	.82	4.34	3.55	3.23	4.05	3.94	37.87
"	"	Assynt (Achumore)	7.30	12.10	6.30	5.10	1.80	.40	1.00	6.60	7.00	4.70	8.60	7.50	68.40
"	Caithness	Wick H.R.S.	1.72	3.68	2.40	2.55	.67	.95	1.92	5.39	2.64	4.15	2.12	2.50	30.69
"	Shetland	Sumburghhead (Dunrosness)	3.77	3.77	2.68	.95	.81	.43	2.03	5.79	2.81	4.41	2.83	5.45	35.73

IRELAND.

XX.	Cork	Dunmanway (Coolkelure)	7.12	4.26	3.77	4.93	4.79	1.67	1.67	8.78	3.34	6.10	5.63	7.83	59.89
"	"	Cork (Blackrock)	3.40	2.71	1.64	3.45	4.72	1.76	1.54	4.85	.99	3.68	2.49	3.95	35.18
"	"	Ballyhooly (Wood Cottage)	5.28	3.37	1.49	4.74	3.68	2.51	1.75	5.64	1.35	4.11	2.42	4.91	41.25
"	Kerry	Kenmare (Derreen)	9.16	4.80	1.07	5.41	6.40	3.77	1.62	7.29	3.23	4.73	8.08	6.29	61.85
"	"	Dromore Castle	7.28	4.87	3.78	3.56	4.80	1.71	2.20	8.63	2.45	4.94	4.13	5.82	54.17
"	"	Waterford (Brook Lodge)	2.51	2.41	1.33	1.91	3.32	1.15	2.42	4.78	.85	5.05	1.92	4.40	32.05
"	"	Tipperary (Henry Street)	2.99	3.35	1.04	3.31	3.75	1.64	2.06	5.11	1.38	4.06	2.12	3.18	33.99
"	"	Nenagh (The Lodge)	3.57	2.23	1.64	2.32	2.44	.62	2.40	4.81	.75	2.26	1.58	3.40	28.02
"	"	Ballingarry (Hazelfort)	2.14	1.90	1.70	2.57	3.03	3.13	1.78	5.22	1.05	4.00	1.58	3.73	31.83
"	Limerick	Jane Ville	4.11	3.06	.56	4.37	3.69	.70	2.32	6.66	1.83	4.67	3.97	4.11	40.05
"	"	Foynes	3.24	3.54	1.36	2.51	3.00	.66	3.20	5.54	1.98	3.90	2.22	4.42	35.57
"	Clare	Ennis	4.10	3.29	1.59	3.01	4.28	.97	2.98	5.41	2.15	3.79	2.19	5.12	39.88
"	"	Miltown Malbay	4.27	2.93	2.00	2.73	4.80	1.06	3.77	6.08	3.22	3.80	3.62	5.95	44.23
XXI.	"	Ballyhyland	2.51	2.61	1.82	2.46	3.85	1.18	2.38	4.59	1.04	5.52	1.63	4.21	33.30
"	Wexford	Gorey (Courtown)	2.34	2.32	1.08	1.93	3.07	.26	2.57	3.85	1.60	6.32	1.25	3.13	29.72
"	"	Rosbercon Castle	2.61	1.62	1.18	1.93	3.23	.75	1.24	4.70	.60	3.17	1.87	3.72	26.62
"	Kilkenny	Kilkenny (Lavistown)	1.75	1.57	.85	1.85	2.64	.83	1.84	5.82	.50	4.10	1.60	3.04	26.39
"	"	Bray (Fassaroe)	3.81	3.53	2.55	3.57	4.23	.30	2.54	6.07	1.36	8.66	1.00	2.92	40.54
"	Wicklow	Browne's Hill	2.36	2.09	1.23	2.01	2.58	.86	2.09	5.13	.81	5.77	1.83	4.45	31.21

IRELAND—(continued.)

Div.	County.	Station.	Jan.	Feb.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.	Total.
XXI.	Queen's Co.	Abbey Leix (Blandsfort)...	2.42	2.70	1.39	2.20	2.98	.99	1.56	5.66	.80	5.12	1.79	3.65	31.26
	Kildare	Straffan House	1.67	2.34	1.51	2.31	2.03	.24	1.89	5.74	1.04	5.73	1.50	2.37	28.37
	Dublin	Glasnevin(BotanicGardens)	1.83	2.16	.91	2.39	1.67	.04	2.17	5.26	1.13	4.82	1.08	2.01	25.47
	Meath	Trim	2.52	2.49	1.80	1.88	2.67	.11	1.49	4.39	1.33	4.43	1.85	3.75	28.71
	"	Moynalty (Westland)	2.90	2.90	2.05	2.60	3.23	.34	2.00	6.46	1.90	6.25	1.67	3.61	35.91
	"	Mullingar (Belvedere)	1.82	2.59	1.92	2.56	2.69	.83	2.62	5.78	2.03	5.29	1.69	2.96	32.78
	"	Athlone (Twyford)	2.48	2.31	2.11	2.57	3.43	1.49	2.19	5.26	1.45	4.59	1.68	3.48	33.04
	Louth	Stephentown	2.58	2.12	2.21	4.22	3.84	.16	1.84	6.72	1.61	4.98	1.72	2.40	34.40
	"	Greenore	2.21	2.04	2.64	3.57	3.40	.11	2.53	5.33	1.44	3.82	1.30	3.02	31.41
	Longford	Edgeworthstown	3.06	1.89	1.66	2.72	3.84	.98	2.40	5.11	2.39	4.55	2.05	3.29	33.94
XXII.	Galway	Ballinasloe	2.94	2.55	1.97	2.35	3.59	1.15	1.91	4.21	1.44	4.43	1.55	3.81	31.90
	"	Kylemore	8.10	3.53	5.58	3.24	7.91	2.41	4.93	9.83	4.40	7.02	6.49	8.09	71.53
	"	Tuam	4.64	2.92	2.26	2.53	4.38	1.14	2.02	5.69	2.10	5.67	2.88	4.48	40.71
	Mayo	Ballinrobe (Cranmore) ...	4.38	3.59	2.35	2.53	5.16	1.58	2.25	5.64	2.65	6.93	2.71	4.91	44.68
	"	Westport (Oldhead)	5.00	3.80	3.00	1.80	5.50	.50	4.20	9.10	2.20	8.50	2.90	7.00	53.50
	"	Crossmolina (Enniscoe) ...	4.36	4.83	2.50	3.03	4.97	1.67	1.78	7.02	2.19	7.23	2.22	4.78	46.58
	Sligo	Sligo (Mount Shannon) ...	3.71	3.30	1.63	2.47	4.97	1.18	2.62	6.62	2.28	6.69	2.45	4.06	41.98
	Leitrim	Ballinamore (Lauderdale)..	3.87	3.38	1.80	3.14	3.96	.77	2.27	5.62	2.89	4.63	2.67	4.90	39.90
	Cavan	Belurbet (Red Hills)	2.74	2.45	2.15	2.88	3.83	.53	2.27	6.04	2.50	3.59	2.34	3.84	35.16
	Fermanagh	Enniskillen (Florence Crt.)	3.73	2.30	1.11	1.05	3.64	.90	2.75	4.94	4.16	5.69	2.69	4.53	37.49
XXIII.	Armagh	Edward St. [Newry]	4.40	3.05	3.28	3.88	4.66	.13	3.61	7.05	1.62	3.45	2.61	3.29	41.03
	"	Armagh	2.07	1.64	1.71	3.17	3.16	.26	2.91	6.66	2.11	3.14	1.54	2.27	30.64
	Down	Newcastle (Fairleigh)	5.12	3.77	4.81	4.77	3.93	.36	6.12	6.37	1.86	6.07	2.07	4.10	49.35
	"	Donaghadee	2.40	2.17	2.34	2.28	2.41	.48	3.41	7.29	1.63	2.59	1.69	2.11	30.80
	Antrim	New Barnsley	3.39	3.71	3.48	3.57	1.89	.53	3.48	7.98	3.31	4.02	2.26	3.25	40.87
	"	Ballymena	3.54	3.73	2.51	2.82	3.31	.69	3.08	6.54	3.41	4.40	2.91	3.51	40.45
	"	Bushmills (Dundarave) ...	2.78	3.24	2.28	3.06	2.48	.78	3.77	6.15	3.72	3.78	2.57	4.29	38.90
	Londonderry	Newtown Limavady	2.55	3.09	1.74	2.58	2.05	.33	4.13	6.93	2.90	3.08	1.70	2.54	33.62
	Tyrone	Stewartstown (Ardtree) ...	3.00	2.61	1.43	3.39	3.67	.30	3.86	6.91	2.18	3.64	2.22	3.11	36.32
	"	Omagh (Edenfel)	3.37	2.65	2.31	3.09	3.62	.41	2.69	5.69	2.51	4.42	2.00	4.39	37.15
Donegal	Castlefenn (Finn Lodge) ...		3.57	2.17	2.52	3.13	2.59	.59	2.67	6.68	1.65	3.95	1.75	3.69	34.96
	"	Malin Head	2.20	2.40	2.21	3.02	3.22	.36	2.94	6.36	2.68	3.59	1.30	4.01	34.29

MAPS OF MONTHLY RAINFALL IN 1889.



• Within an inch of average.

+ More than 1 in. above average.

— " " " below " "

MAPS OF MONTHLY RAINFALL IN 1889.



• Within an inch of average.

+ More than 1 in. above average.

— „ „ „ below „

JANUARY.

A dry month except in the West of Ireland and the West and South-west of Scotland. At 52 English and Welsh stations, and 10 Scotch ones out of the 233 quoted in the foregoing tables, that is to say at more than a quarter of them, the total fall in the month was less than an inch.

FEBRUARY.

Quite an average month ; slight excesses in some parts, and defects in others, but on the whole near the average.

MARCH.

Another month with the rainfall generally near the average. There was, however, an excess in some of the Midland counties, and in the S.W. of England, and a deficiency at several Scotch stations, notably at Edinburgh, where the first three months yielded respectively only 0·60 in., 0·80 in., and 0·60 in., or 2 in. for the three months.

APRIL.

As a whole a wet month, especially in the Midland and Western counties of England, also in the N. of Ireland, in which districts several stations had more than twice their average April fall. It was, however, dry in Devon and Cornwall, several stations in those counties having less than half their average.

MAY.

Rather a large rainfall over the Midland and Southern counties of England. The observer at Addington (Bucks) says that although it was a fine month they had three falls of rain, each exceeding an inch, and causing floods. In the N. and E. of Scotland the fall was below the average. In Ireland it was rather above it.

JUNE.

The tables for this month are remarkable. That in the *Meteorological Magazine*, page 94, shows that out of the 36 stations nearly equally distributed over the British Isles, not one had the average fall. The fall was less than an eighth of the average at several stations, the most marked deficiencies being at the following :—

Barnstaple the fall was only 12 per cent. of the average for June.					
Boston	„	„	12	„	„
N. Shields	„	„	11	„	„
Cardiff	„	„	11	„	„
Inverness	„	„	5	„	„
Dublin	„	„	5	„	„

The preceding tables (on pages [88] to [94]) show the following very small totals :—

II. I. of Wight (Sandown). .17 in.	XXI. Dublin (Glasnevin)..... .04 in.
V. Cullompton 09 „	„ Meath (Trim) 11 „
Bude 18 „	„ Louth (Stephenstown). .16 „
IX. Hull (Patrington) 13 „	„ „ (Greenore) 11 „
XIX. Shetland 15 „	XXIII. Armagh (Edward St.). .13 „

At all the following additional stations the fall was either 0.15 in. or less.

V. Tiverton (Cove)..... .15	X. Durham (Tow Law) 00
VII. New Holland 14	XI. Dowlais (Cwm Bargoed).. .14
„ Stretton (Lindway Res.). .07	XVIII. Inverness (Culloiden)..... .11
IX. Sheffield (Victoria St.) 05	XXI. Wicklow (Greystones) 15
„ Skipton (Thorpe Fell) 10	„ Balbriggan (Laragh) 11
„ Leyburn (Bolton Hall) .. .10	XXIII. Down (Warrenpoint)..... .03
„ Hambleton (Paradise) 14	„ Rathfryland (Ballynaga-
„ Richmond (The Grove) 15	„ „ poguee) 05
„ Bowes 10	„ Banbridge (Katesbridge). .05
„ Middleton (Mickleton) 14	„ „ (Corbet Res.). .10
X. Barnard Castle (Whorlton) .15	„ Folcaragh (Ardnadrean). .00
„ Darlington (Brinkburn) .. .15	

JULY.

The fall this month was (as is generally the case with July) irregular. The July rainfall is chiefly the product of thunderstorms which discharge large quantities of rain over small areas, and therefore the question whether a station has more or less than the average, depends chiefly on whether it received or escaped the principal thunderstorm rains. These rains are I believe heavier and more frequent over England than over Wales, Scotland or Ireland, and therefore, it is in England that the July fall is the most variable. The great rain of July 12th, already reported in the article on max. falls, naturally produced considerable excesses in the Midland counties ; with that exception there does not seem to be any noteworthy departure from the average in any part of the country—except perhaps that it was rather unusually dry in the West of Scotland.

AUGUST.

The great month for holiday makers, and wet nearly everywhere except in the S.E. of England and in the Severn valley.

SEPTEMBER.

A dry month except in the Eastern counties of England, where (owing to heavy thunderstorms) the rainfall was slightly above the average.

OCTOBER.

On the whole an average month. Over most parts of England and Ireland there was a slight excess ; in Wales and in Scotland a slight deficiency.

NOVEMBER.

A dry month at all, but a few isolated stations, *e.g.*, one in Ayrshire and one in Rosshire, but it was not so remarkably dry as June.

DECEMBER.

The rainfall this month was on the whole rather below the average, excess occurring almost exclusively at stations in mountain districts, but neither excesses nor defects were sufficiently large to call for special comment.

ON THE RELATION OF THE TOTAL RAINFALL IN 1889 TO THE AVERAGE.

WE have several modes of determining the relative wetness of each year as it passes, but there are only four which we usually publish, or it may be said three, because one is an abstract of one of the others. The four are :—

- (1) The comparison tables on pages [100] to [103].
- (2) The abstract table given below.
- (2) The map facing title page.
- (4) The value at the foot of the sixth column of Table V. p. [81].

From the comparison table we see that the rainfall in 1889 was generally below the average, and that it was less than three-quarters of the average at one or more stations in the following counties :— Wilts, Dorset, Devon, Somerset, Salop, Derby, Lancashire, Cumberland, Glamorgan, Kinross, Perth and Inverness. We see also that there were slight excesses in Hertford, Bedford, Cambridge, Suffolk, Norfolk, Leicester, Lincoln, Nottingham and Derby ; also in two counties at opposite ends of Scotland, viz., Roxburgh and Orkney.

ABSTRACT.

COUNTRIES.	No. of Records.	Mean 1860-69.	Mean 1870-79.	1889.	Diff. from Average. 1870-79.	
					Amount.	Per cent
		in.	in.	in.	in.	
England and Wales...	104	34·97	35·94	31·10	4·84	— 11
Scotland.....	28	39·30	41·42	32·81	8·61	— 20
Ireland	4	37·51	38·54	33·49	5·05	— 12
Mean of all Stations...	136	35·93	37·14	31·52	5·62	— 13

From the above abstract we see that on the whole there has been about one-eighth less rain than the yearly average during the ten years 1870-79. But it must be remembered that we have repeatedly mentioned that the average of those ten years is above the true mean by about 5 per cent. This, however, still leaves 1889 about 8 per

cent. below the true average, as well as 13 per cent. below that of 1870-79.

The map gives us the best information as to the relation of the fall in 1889 in different parts of the country to the average in those parts. Compare, for instance, the number of signs inside rings (that is to say, stations at which the fall was more than 25 per cent. below the average) in the 1888 map, with the present one for 1889. There were *eight* such cases in the former year; there are *twenty-eight* in 1889, forming two belts, one taking Devon, Dorset, Somerset and nearly the whole of Wales, and the other taking Central Scotland. Eastern England and North-Eastern Scotland alone show average fall, or slight excess.

The value in the foot of Table V. p. 81, is the result of a most roundabout way of getting at the relation of the rainfall in the year to the average of the previous 24 years, but it gives an independent approximation, and makes the deficiency 15 per cent., whereas the abstract table on the previous page gave 13 per cent.; subject, of course, as already pointed out, to a reduction of 5 per cent. if compared with the true mean of a very long period.

It may be convenient to many of our readers if we add here the data required to complete, up to date, the diagram of the rainfall from 1726 onwards, which was given as a frontispiece to *British Rainfall*, 1886. The diagram was left with blank spaces so that the years 1887 to 1889 inclusive might be added. The following table gives the necessary data :—

	Mean.	Chilgrove.	Nash Mills.	Oxford.	Exeter.	Orleton.	Pode Hole.	Boston.	Bolton.	Kendal.	Mean.
Rainfall	1887	25·31	20·44	18·98	22·18	21·07	15·13	14·67	27·92	32·37	
	1888	35·33	27·76	26·84	32·12	28·80	21·46	22·25	36·59	43·04	
	1889	29·70	27·62	22·93	23·48	25·91	26·50	23·06	39·60	43·15	
Ratio	1887	75	76	81	73	70	59	65	59	63	69
	1888	105	104	115	106	96	84	98	77	84	96
	1889	88	103	98	78	86	104	102	84	84	92

Therefore, the last three columns in the diagram have to be filled in up to 69, 96, and 92 respectively.

Finally, 92 is, of course, 8 short of 100, *i.e.*, 1889 had 8 per cent. less than the average rainfall, which is identical with the result obtained from the abstract table, when corrected for the excess of 1870-79.

COMPARISON OF THE RAINFALL OF THE YEAR 1889,
WITH THE AVERAGE OF THE YEARS 1870-79.

ENGLAND & WALES.

DIV.	COUNTY.	STATION.	Average.		Depth in 1889.	Difference from average, 1870-9.	
			1860-9.	1870-9.		Amount.	Per cent.
			in.	in.	in.	in.	
I.	Middlesex ...	London (Camden Square)	25·68	27·24	23·85	3·39	— 12
II.	Surrey	Seething Wells	26·55	25·73	21·07	4·66	— 18
"	"	Wimbledon	23·48	25·11	24·48	·63	— 3
"	"	Kew Observatory	23·28	24·76	23·60	1·16	— 5
"	Kent	Maidstone (Hunton Ct.)..	26·00	26·06	23·24	2·82	— 11
"	"	Greenwich (Royal Obser.)	25·18	25·39	23·28	2·11	— 8
"	West Sussex.	Chichester (Chilgrove) ...	33·22	35·03	29·70	5·33	— 15
"	East Sussex.	Lewes (Glynde Place) ...	33·65	33·75	30·01	3·74	— 11
"	"	Maresfield (Forest Lodge)	31·48	33·37	29·80	3·57	— 11
"	Hampshire ..	Isle of Wight (Osborne).	30·73	29·21	24·08	5·13	— 18
"	"	Petersfield (Liss Place) ...	38·03	36·65	28·42	8·23	— 22
"	Berkshire ...	Newbury (Welford)	28·97	31·92	27·95	3·97	— 12
III.	Herts	St. Albans (Gorhambury).	27·85	29·07	26·71	2·36	— 8
"	"	Hemel Hempstead	26·39	28·66	27·62	1·04	— 4
"	"	Hertford (Bayfordbury) ..	25·01	27·02	28·03	1·01	+ 4
"	"	Hitchin	23·92	25·67	24·73	·94	— 4
"	"	Royston	23·57	23·74	24·41	·67	+ 3
"	Northampton	Northampton (Althorp) ..	23·35	26·93	24·68	2·25	— 8
"	"	Wellingborough	24·09	25·72	25·26	·46	— 2
"	Bedford	Cardington	22·49	25·13	25·27	·14	+ 1
"	"	"	21·76	23·69	24·39	·70	+ 3
"	Cambridge...	Ely (Stretham)	20·61	23·11	27·97	4·86	+ 21
IV.	Suffolk	Bury S. Edmund (Westley)	23·52	25·51	29·70	4·19	+ 16
"	"	Carlton Colville	24·29	26·42	26·09	·33	— 1
"	Norfolk	Norwich (Costessey)	24·04	27·44	24·36	3·08	— 11
"	"	Hunstanton	19·56	23·26	24·36	1·10	+ 5
V.	Wiltshire ...	Salisbury Plain (Chitterne)	29·28	30·53	22·74	7·79	— 26
"	"	Swindon (Pen Hill)	28·59	29·64	21·67	7·97	— 27
"	Dorset	Cerne Abbas (Melbury) ...	39·99	40·92	28·44	12·48	— 30
"	Devon	Tavistock Public Library	43·36	52·52	38·63	13·89	— 26
"	"	Exeter (D. & E. Inst.) ...	31·76	34·69	23·48	11·21	— 32
"	"	Barnstaple	39·91	42·43	30·86	11·57	— 27
V.	Somerset ...	Glastonbury (Street) 1 ft.	30·01	33·14	26·42	6·72	— 20

ENGLAND & WALES.—Continued.

DIV.	COUNTY.	STATION.	Average.		Depth in 1889.	Difference from average, 1870-9.	
			1860-9.	1870-9.		Amount.	Per cent.
			in.	in.	in.	in.	
V.	Somerset ...	Sherborne Reservoir	42·10	47·26	33·85	13·41	— 28
VI.	Gloucester ...	Clifton	34·09	36·36	30·49	5·87	— 16
"	Hereford ...	Ross (The Graig)	28·21	31·75	27·91	3·84	— 12
"	Shropshire...	Oswestry (Hengoed)	35·65	39·55	26·97	12·58	— 32
"	Worcester ...	Northwick Park.....	28·02	32·34	25·66	6·68	— 21
"	"	Tenbury (Orleton)	30·90	33·26	25·91	7·35	— 22
VII.	Leicester ...	Thornton Reservoir	25·61	27·59	27·19	·40	— 1
"	"	Loughborough(Cedar Cot)	27·67	29·54	30·79	1·25	+ 4
"	"	Belvoir Castle.....	24·48	25·75	32·42	6·67	+ 26
"	Lincoln	Spalding (Pode Hole).....	25·34	24·82	26·50	1·68	+ 7
"	"	Lincoln M.S.&L.R.	20·87	23·70	26·01	2·31	+ 10
"	"	Gainsborough M.S.&L.R.	21·66	22·35	21·59	·76	— 3
"	"	Stockwith M.S.&L.R.	21·35	23·20	26·95	3·75	+ 16
"	"	Brigg M.S.&L.R.	24·12	23·31	22·30	1·01	— 4
"	"	Grimsby M.S.&L.R.	21·39	23·04	23·14	·10	+ 0
"	"	Barnetby M.S.&L.R.	22·16	25·17	25·67	·50	+ 2
"	"	Appleby Vicarage	24·10	26·64	25·43	1·21	— 5
"	"	New Holland M.S.&L.R.	22·66	25·29	20·36	4·93	— 19
"	"	Workshop M.S.&L.R.	22·47	25·63	23·86	1·77	— 7
"	Nottingham.	Retford M.S.&L.R.	22·74	23·04	25·90	2·86	+ 12
"	"	Chesterfield ..M.S.&L.R.	26·93	30·54	26·82	3·72	— 12
"	Derby.....	Combs Moss M.S.&L.R.	49·62	45·71	32·84	12·87	— 28
"	"	" ReservoirM.S.&L.R.	50·01	45·67	32·36	13·31	— 29
"	"	Chapel-en-le-FrithMS&LR	41·95	42·56	33·65	8·91	— 21
"	"	Killamarsh ...M.S.&L.R.	24·59	26·79	27·62	·83	+ 3
"	"	Woodhead Station MS&LR	52·19	49·87	44·71	5·16	— 10
VIII.	Cheshire.....	Bosley Reservoir MS&LR	32·04	34·10	30·35	3·75	— 11
"	"	" Minns M.S.&L.R.	32·85	33·90	33·02	·88	— 3
"	"	Bollington (Spond's Hill)	37·46	35·52	30·48	5·04	— 14
"	"	Whaley M.S.&L.R.	43·89	43·38	38·61	4·77	— 11
"	"	MarpleTopLockM.S.&L.R	35·25	35·94	32·60	3·34	— 9
"	"	" Aqueduct MS&LR	34·81	33·73	29·59	4·14	— 12
"	"	Godley Reservoir	33·98	34·85	31·24	3·61	— 10
"	"	Newton M.S.&L.R.	31·63	29·30	27·39	1·91	— 7
"	"	Mottram (Matley's Field)	37·73	36·32	32·45	3·87	— 11
"	"	Arnfield Reservoir	37·23	41·38	35·45	5·93	— 14
"	"	Rhodes Wood Reservoir..	46·32	44·74	42·35	2·39	— 5
"	"	Woodhead Reservoir	51·83	49·74	45·14	4·60	— 9
"	"	Denton Reservoir	32·97	33·78	29·86	3·92	— 12
"	Lancashire...	Gorton Reservoir	33·71	34·14	28·81	5·33	— 16
"	"	Manchester (Piccadilly)...	36·78	34·72	25·90	8·82	— 25
"	"	" (Fairfield)M.S.&L.R.	40·90	37·66	32·90	4·76	— 13
"	"	AshtonWaterhousesMSLR	36·13	39·24	32·58	6·66	— 17
"	"	Bolton (The Folds).....	48·98	47·23	39·60	7·63	— 16
"	"	" (Heaton)1 ft. 3 in.	44·21	45·11	36·10	9·01	— 20
"	"	Ormskirk (Rufford)	35·00	36·65	28·78	7·87	— 21
"	"	Bolton (Belmont)	56·61	59·91	56·00	3·91	— 7

ENGLAND & WALES.—*Continued.*

DIV.	COUNTY.	STATION.	Average.		Depth in 1889.	Difference from average, 1870-9	
			1860-9.	1870-9.		Amount.	Per cent.
			in.	in.	in.	in.	
VIII.	Lancashire ..	Heywood (Nayden Dane).	44·13	44·67	34·36	10·31	— 23
"	" ..	Blackburn (Guide Res.)..	41·30	44·49	34·22	10·27	— 23
"	" ..	Blackpool (South Shore).	32·99	34·43	29·62	4·81	— 14
"	" ..	Stonyhurst College... 1 ft.	48·56	48·74	42·48	6·26	— 13
"	" ..	Clitheroe (Downham Hall)	44·79	43·40	37·00	6·40	— 15
"	" ..	Cartmel (Holker)	45·63	45·13	38·45	6·68	— 15
IX.	Yorks, W.R.	Sheffield (Redmires)	39·68	42·80	38·53	4·27	— 10
"	" ..	" (Broomhall Pk.)	31·28	32·67	27·49	5·18	— 16
"	" ..	Dunford Bridge Station ..	56·18	52·51	39·97	12·54	— 24
"	" ..	Penistone.....	30·57	34·37	30·46	3·91	— 11
"	" ..	Halifax (Midgely Moor) ..	50·00	48·07	41·32	6·75	— 14
"	" ..	" (Warley)	46·33	45·27	39·93	5·34	— 12
"	" ..	Arncliffe	60·07	60·95	49·60	11·35	— 19
"	" N.R.	Malton.....	27·46	28·44	23·98	4·46	— 16
X.	North'mblnd	N. Shields (Rosella Place)	26·06	28·02	24·72	3·30	— 12
"	" ..	Whittle Dean ..	25·42	27·75	22·87	4·88	— 18
"	" ..	Ilderton (Lilburn Tower).	28·66	31·33	28·91	2·42	— 8
"	Cumberland.	Seathwaite ...	154·05	134·95	106·24	28·71	— 21
"	" ..	Ullswater (Hallsteads) ...	58·13	55·31	39·60	15·71	— 28
"	" ..	Keswick Post Office 6 ft.	62·40	59·14	44·22	14·92	— 25
"	" ..	Cockermouth(Whin. Hall)	57·37	52·15	42·88	9·27	— 18
"	Westmorelnd	Kendal... ..	53·32	51·78	43·15	8·63	— 17
XI.	Glamorgan ..	Cardiff (Ely)	42·02	46·35	34·26	12·09	— 26
"	Carnarvon ...	Llandudno	31·00	33·63	28·42	5·21	— 15

SCOTLAND.

DIV.	COUNTY.	STATION.	Average.		Depth in 1889.	Difference from average, 1870-9	
			1860-9.	1870-9.		Amount.	Per cent.
			in.	in.	in.	in.	
XII.	Kirkcudbright	Cargen [Dumfries].....	44·37	46·65	37·07	9·58	— 21
„	Dumfries ...	Dumfries (Crichton Inst.)	39·00	41·84	32·28	9·56	— 23
„	Roxburgh ...	Kelso (Springwood Park)	24·66	27·90	28·11	·21	+ 1
XIII.	Peebles	North Esk Reservoir ..	38·01	38·66	34·85	3·81	— 10
„	Haddington.	East Linton	23·77	29·36	24·13	5·23	— 18
„	Edinburgh ..	Glencorse	37·52	40·52	35·05	5·47	— 13
„	„	Harlaw	37·64	38·04	32·10	5·94	— 16
XIV.	Lanark	Hamilton (Bothwell Cas)	28·89	31·72	20·06	11·66	— 37
„	Ayr.....	Kilmarnock (N. Craig) ...	43·29	40·16	32·07	8·09	— 20
„	Renfrew	Ryat Lynn	47·80	50·07	39·50	10·57	— 21
„	„	Waulk Glen	49·85	48·41	38·30	10·11	— 21
XV.	Stirling	Stirling (Kerse)	32·96	33·47	25·50	7·97	— 24
„	Argyll	Lochgilphead (Poltalloch)	54·25	56·35	42·39	13·96	— 25
„	„	Stonefield	69·62	71·73	59·26	12·47	— 17
XVI.	Kinross	Loch Leven.....	36·22	38·05	28·30	9·75	— 26
„	Perth	Aberfoyle.....	61·82	59·39	43·95	15·44	— 26
„	„	Dunblane (Kippenross)...	36·16	36·00	27·90	8·10	— 23
„	„	Lanrick Castle	48·48	47·46	36·10	11·36	— 24
„	„	Bridge of Turk	61·89	72·32	48·35	23·97	— 33
„	Forfar..	Craigton	M 34·88	41·96	32·79	9·17	— 22
„	„	Hill Head	M 35·19	41·82	31·77	10·05	— 24
XVII.	Kincardine..	The Burn [Brechin]	34·91	37·85	29·00	8·85	— 23
„	Aberdeen ...	Braemar	33·40	38·14	29·49	8·65	— 23
„	„	Aberdeen (Rose Street)	29·43	31·75	25·60	6·15	— 19
„	Elgin	Gordon Castle.....	29·19	32·26	26·62	5·64	— 17
XVIII.	Inverness....	Culloden	27·08	25·46	18·72	6·74	— 26
XIX.	Sutherland..	Golspie (Dunrobin Cas.)M	27·69	31·94	28·18	3·76	— 12
„	Orkney	Shapinsay (Balfour Cas.).	32·41	30·41	31·30	·89	+ 3

IRELAND.

XX.	Waterford ...	Portlaw	44·44	41·65	35·35	6·30	— 15
XXI.	Kilkenny ...	Inistioge (Woodstock) ...	39·38	46·64	36·76	9·88	— 21
XXIII.	Armagh	Armagh Observatory..1ft.	32·01	30·95	30·64	·31	— 1
„	Antrim	Belfast (Queen's Coll.)....	34·22	34·92	31·20	3·72	— 11

EXTREMES OF RAINFALL IN 1889.

Largest Rainfall, at The Sty, Cumberland.....	152·85 in. -
Least Rainfall, at Dingwall, East Ross.....	14·51 ,,

ENGLAND.

GREATEST.		LEAST.	
Div.	in.	Div.	in.
X. The Sty	152·85	II. Esher Sewage Works	18·42
„ Sprinkling Tarn	116·08	IX. Partrington (Spurn Head)	19·02
„ Styhead Tarn ..	115·56	III. Dorchester, Oxon	19·14
„ Seathwaite (5 in.).....	106·24	II. Old Windsor (Friary Gardens)...	19·29
„ Wastdale Head.....	87·35	„ Reading (Forbury Gardens) ...	19·46
„ Ullscarf.....	85·90	V. Langport (Huish Episcopi)...	19·61

WALES.

GREATEST.		LEAST.	
Div.	in.	Div.	in.
XI. Llanbedr-y-Cennin(Llyndulyn)	92·20	XI. Rosset (Trevalyn Hall)	24·42
„ Garthbibio (Bwlch Tomlyd)...	79·60	„ Rhy! (Sedgley House)	24·49
„ Rhiwbryfdir	79·24	„ Derbyhaven	25·68
„ Blaenau Ffestiniog ...	76·71	„ Wrexham (Is-y-coed)	26·59
„ Dolgelly (Brithdir)	62·27	„ Pembroke (St. Ann's Head)	27·04
„ Neath (Glyncorrwg)	59·86	„ Cowbridge (Fonmon Castle)	27·78

SCOTLAND.

GREATEST.		LEAST.	
Div.	in.	Div.	in.
XVIII. Ben Nevis Observatory.....	120·71	XVIII. Dingwall H.R.S.	14·51
„ Glenquoich	88·26	„ Inverness H.R.S.	17·36
„ Loch Shiel (Glenaladale) ...	87·11	XIII. Bo'ness (Grange)	17·70
„ Glencarron Lodge	79·71	XVIII. Fearn (Arboll)	17·87
XVI. Glen Gyle	76·30	XVII.. Nairn (School House)	19·30
XV. Lock Eil (Conaglen)	74·30	XVIII. Fearn (Lower Pitkerrie) ...	19·49

IRELAND.

GREATEST.		LEAST.	
Div.	in.	Div.	in.
XX. Mangerton	96·00	XXI. Killiney (Cloneevin)	24·22
XXII. Clifden (Kylemore Castle) ...	73·36	„ Glasnevin (Botanic Gardens)	25·47
„ („ House) ...	71·53	„ Killiney (Eirine)	25·87
XXIII. Killybegs	64·53	„ Kilkenny (Lavistown).....	26·39
XX. Kenmare (Derreen)	61·85	„ Balbriggan (Laragh)	26·59
„ Dingle	60·22	„ Rosbercon Castle	26·62

NOTE.

In selecting the minima, no record is used from any gauge of which the receiving surface is more than 3 ft. above the ground. Second gauges, and those at Lighthouses, are also excluded.

GENERAL TABLES
OF
TOTAL RAINFALL IN 1889,
AT UPWARDS OF
2000 STATIONS
IN THE
BRITISH ISLES.

EXPLANATION OF THE ARRANGEMENT OF THE FOLLOWING GENERAL TABLES.

The divisions are the same as those adopted by the Registrars General of England and Scotland, and the counties follow the same order as in the reports of those officers ; but an alphabetical list of the counties is given, whereby the page or pages on which all returns from each county will be found, can be at once ascertained.

The stations in each county are arranged nearly in the order of their latitude from South to North.

To facilitate finding the fall in any part of the country, the first name is almost always that of a place given in *Bradshaw*, the *British Postal Guide*, or the *Clergy Directory* ; the second name is generally added to fix accurately the site of Observation ; but, in a very few instances, the second name is in [] instead of () ; it then shows that the nearest town is in an adjoining county. For instance, “Lowestoft (Carlton Colville)” means Carlton Colville, near Lowestoft, both being in one county, but “Geldeston [Beccles]” means Geldeston, Norfolk, near Beccles, in another county—Suffolk.

The contents of the columns are sufficiently explained by the headings, except that in the column headed “diameter,” figures will occasionally be noticed of a different type from the rest of the tables, these figures indicate the length of the sides of rectangular mouthed gauges. These measurements are all in inches.

The letter D denotes that a copy of the daily record has been received, that it is perfect throughout the year, and that the printed amount is the correct total of these daily entries. The letter M indicates a monthly record, *i.e.*, that the observation is made only on the first of each month.

An asterisk * denotes that the gauge was tested before erection, and a † that it has been visited and examined since. A note of interrogation (?) implies doubt, not necessarily error. ... indicates the absence of information.

In the column of altitudes several symbols are used, their meaning is as follows :— ∇ , that a series of levels has been taken from the gauge to an Ordnance bench mark ; $\dagger$, that the height is estimated or ascertained approximately from the same source ; $\perp$, that levels have been taken from the gauge to the sea, or to some datum other than Ordnance mean sea level ; $\mathcal{B}$, that the altitude has been taken by the barometer ; and ? , that the height is uncertain

COUNTY INDEX TO GENERAL TABLES.

ENGLAND .

Bradford.....	120	Hereford	131	Oxford	118
Berks	117	Hertford	117	Rutland.....	135
Buckingham	118	Huntingdon	120	Shropshire.....	132
Cambridge.....	121	Kent	111	Somerset	129
Cheshire	138	Lancashire	139	Stafford	132
Cornwall	128	Leicester	134	Suffolk	122
Cumberland	150	Lincoln	135	Surrey	109
Derby	137	Middlesex.....	108	Sussex	113
Devon	126	Monmouth	152	Warwick	134
Dorset.....	125	Norfolk	123	Westmoreland	151
Durham	148	Northampton ...	119	Wiltshire	124
Essex	121	Northumberland ...	149	Worcester.....	133
Gloucester.....	130	Nottingham	137	Yorkshire	143
Hampshire.....	115				

WALES .

Anglesea	155	Carnarvon.....	155	Merioneth	155
Brecknock.....	154	Denbigh.....	155	Montgomery.....	154
Cardigan	153	Flint	154	Pembroke	153
Carmarthen	153	Glamorgan	152	Radnor	154

ISLANDS .

Isles of Scilly	156	Guernsey	156	Isle of Man	156
Alderney	...	Jersey	156	Sark	...

SCOTLAND .

Aberdeen	164	Elgin (or Moray)...	164	Orkney	166
Argyll	161	Fife	162	Peebles.....	158
Ayr	159	Forfar	163	Perth	162
Banff	164	Haddington	158	Renfrew	160
Berwick..	158	Inverness	165	Ross	164
Bute	161	Kincardine	163	Roxburgh	157
Caithness	166	Kinross	162	Selkirk.....	158
Clackmannan	162	Kirkcudbright.....	157	Shetland	166
Cromarty	164	Lanark	159	Stirling	161
Dumbarton	160	Linlithgow	159	Sutherland	166
Dumfries	157	Nairn.....	164	Wigton	157
Edinburgh	158				

IRELAND .

Antrim	170	Kerry.....	167	Monaghan	...
Armagh.....	170	Kildare	168	Queen's County	168
Carlow	168	Kilkenny	168	Roscommon	169
Cavan.....	170	King's County	168	Sligo	170
Clare	168	Leitrim	170	Tipperary	167
Cork	167	Limerick	167	Tyrone	171
Donegal.....	171	Londonderry.....	171	Waterford..	167
Down	170	Longford	169	Westmeath	169
Dublin	168	Louth.....	169	Wexford.....	168
Fermanagh.....	170	Mayo	169	Wicklow	168
Galway	169	Meath	169		

ENGLAND AND WALES.

DIVISION I.—MIDDLESEX.

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which ·01 or more fell.
		Diameter	Height Above Ground	Height Above Sea Level	1889	
			ft. in.	feet.	inches.	
MIDDLESEX.						
☐ Sunbury (Hanworth Road)	W. B. Bryan, Esq., C.E.	8	1 0	50 ∇	20·76	178
Teddington (Gomer House)	R. D. Blackmore, Esq..	5	0 10	26 ∇	21·97	161
☐ Staines	J. Gundry, Esq.	5	1 0	51 ∇	21·39	186
„ (Knowle Green)	Miss Pellatt	5	5 2	...	20·17	131
Twickenham (Holy Trinity Vic.)	Miss Anderson	5	1 5	37 ∇	21·14	131
☐ Isleworth (Spring Grove)	R. W. Peake, Esq. ...	5	1 0	69 ∇	24·37	116
☐ Chelsea (Carlyle Mansions)	Mrs. Peck	8	75 11	...	21·58	151
☐ „ (St. Luke's Gardens) ...	TWE.Higgins, Esq. CE	5	1 0	25 ∇	23·09	180
☐ Gunnersbury Station	E. Mann, Esq.	5	0 11	35	23·27	151
Ealing (Local Board Office)	C. Jones, Esq., C.E. ...	5	7 6	85	23·40	106
Westminster (Spring Grdns), S.W.	London County Council	8	6 0	35 ∇	24·41	120
☐ Kensington (Edith Road).....	G. von U. Searle, Esq.	8	66 4	95 ∇	20·11	119
„ (Edith Road).....	M. von U. Searle, Esq.	5	0 8	13 ∇	22·72	176
☐ „ (Holland House) ...	Mr. C. Dixon	5	0 10	13 ∇	22·92	...
☐ „ (Addison Gardens)...	G. H. M. Whish, Esq..	5	6 6	68 ∇	23·48	156
„ (Campden Hill, W.)	M. W. Hervey, Esq....	5	1 1	23 ∇	26·64	180
☐ London (Savile Row, W.)	G. S. Johnson, Esq. ...	8	4 10	130 ∇	25·20	184
☐ „ (Lansdowne Cres. W.)...	G. T. Gwilliam, Esq....	5	...	...	22·78	158
☐ „ (Norfolk Terrace, W.)...	A. P. Baker, Esq.	5	0 9	80 ∇	25·07	180
„ (Guildhall), E.C.	Col. Haywood, C.E. ...	5	0 9	64 ∇	25·22	169
„ (Old Street), E.C.	„ „ „ „	8	2 6	49 ∇	19·96	150
„ (Old Street), E.C.	„ „ „ „	8	51 0	98 ∇	20·31	150
Perivale (Sewage Farm)	The Royal Meteor. Soc.	5	1 0	70 ∇	23·32	170
☐ London (Regent's Pk. R. Bot. Soc.)	C. Jones, Esq., C.E. ...	5	12 0	56	23·84	171
„ (Canonbury)	W. Sowerby, Esq.	8	1 0	126 ∇	26·23	170
„ (Canonbury)	Mrs. Spiller	5	1 3	117	24·03	174

DIVISION I.—MIDDLESEX.—(continued).

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which ·01 or more fell.
		Diameter	Height Above Ground	Height Above Sea Level	1889	
			ft. in.	feet.	inches.	
MIDDLESEX—(con.)						
† London (Camden Square), N.W.	G. J. Symons, Esq. F.R.S.	8	0 8	111 ∇	23·85	169
† " (")	M	5	1 0	111 ∇	24·03	...
† " { 235, " Camden " Road), N.	W. B. Butler, Esq. ...	5	1 0	160 ∇	24·54	180
† " (" " ")	M	5	1 0	160 ∇	24·75	...
Hackney (Richmond Road), N.E.	J. W. Tripe, Esq. M.D.	5	7 0	65 ∇	23·41	175
Hampstead (Roslyn House) N.W.	C. H. L. Woodd, Esq.	8	1 4	330 ∇	27·05	164
" (Kidderpore Reserv.)	M. W. Hervey, Esq. ...	8	1 6	323 ∇	26·62	137
" (Branch Hill Lodge)	B. Woodd Smith, Esq.	8	0 10	380 ∇	25·87	...
† " (Squire's Mount) ...	Rogers Field, Esq. C.E.	5	1 0	388 ∇	26·09	178
" (The Pryors)	" " " " " "	5	1 0	327 ∇	25·96	180
D Stoke Newington Res., N.	J. Francis, Esq., C.E.	9	3 3	104 ∇	23·91	156
D Highgate (Northwood Road)	Mrs. Sowerby Wallis...	5	1 0	265 ∇	25·54	157
† Child's Hill (Helenslea), N.W.	A. J. Woodhouse, Esq.	5	1 6	245 ∇	27·96	186
† " (" " ")	M	5	1 6	245 ∇	25·82	...
D Upper Clapton (Warwick Road)	W. Hayward, Esq. ...	5	3 6	...	29·03	177
D* " (The Common) ..	J. Parnell, Esq.	5	1 1	98 ∇	25·76	167
Finsbury Park (Endymion Ter.)	Rev. E. Healy	5	1 6	153 ∇	23·23	...
D Tottenham	J. E. Worth, Esq., C.E.	8	1 0	47 ∇	25·78	161
D Muswell Hill ..	Miss Abethell	5	0 10	310 ∇	26·98	185
Finchley East (Elmhurst)	B. C. Wainwright, Esq.	8	0 7	300 ∇	27·86	167
† " (Etchingham Park) ...	J. W. Scott, Esq.	5	0 11	295 ∇	26·60	177
D† " (" " ")	" " " " " "	8	1 3	295 ∇	26·79	177
D Pinner Hill	A. Helsham-Jones, Esq.	5	3 6	410 ∇	22·84	143
D Harrow Weald (Hill House) ...	A. Crossman, Esq.	5	0 8	...	25·26	174
D Colney Hatch (Irish Corner) ...	T. De C. Mead, Esq. CE	8	5 11	216	25·41	133
D Friern Barnet (Sewage Works) ..	Baldwin Latham Esq. CE	5	1 0	156 ∇	25·49	169
D Whetstone	" " " " " "	5	...	315 ∇	26·76	135
Winchmore Hill (Chase Side) ...	Mr. G. Duffield	5	1 0	...	29·33	160
D Enfield (Old Park)	A. L. Ford, Esq.	5	1 9	156 ∇	30·28	168
D " (Nag's Head Lane)	J. Francis, Esq., C.E.	12	3 0	108 ∇	30·20	168
D Monken Hadley [Barnet]	F. A. Milne, Esq.	5	0 10	426 ∇	29·18	165

DIVISION II.—SOUTH EASTERN COUNTIES.

SURREY.

D Haslemere	J. W. Penfold, Esq. ...	8	4 0	481 ∇	31·76	168
" (Hazlehurst)	T. P. Newman, Esq. ...	5	1 0	550	33·01	204
" (Grayswood Hill)	B. E. C. Chambers, Esq.	5	1 0	580 ∇	31·60	...
Godalming (Dunsfold)	Mr. W. Underwood ...	5	2 6	166	20·33	...
Haslemere (Weycombe)	G. B. Buckton, Esq. FRS.	5	3 2	583 ∇	29·95	...
Godalming (Hascombe)	E. S. Rowcliffe, Esq. ...	10	2 0	273 ∇	25·75	...
D Ewhurst (Heathside)	J. Sparkes, Esq.	5	0 9	600 ∇	30·18	175
" (Rectory)	L. Barlow, Esq.	5	1 0	344 ∇	28·39	104
D Godalming (Witley)	Mrs. Foster	5	1 0	350 ∇	25·93	176
Dorking (Holmbury)	Mr. Bayman	5	1 0	560 ∇	31·28	233
D " (Abinger Hall)	Sir T. H. Farrer, Bt. ...	8	2 0	320 ∇	30·20	169
† " (Holmwood)	A. Sconce, Esq.	5	1 2	320 ∇	29·62	108

DIVISION II.—SOUTH EASTERN COUNTIES—(continued.)

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which -01 or more fell.
		Diameter	Height Above Ground	Height Above Sea Level	1889	
			ft. in.	feet.	inches.	
SURREY—(con.)						
† Dorking (Fir Tor)	F. Taylor, Esq.	5	0 10	280 B	28·31	...
D Betchworth (Brockham Vic.) ...	Rev. A. Cheales	5	1 0	158 A	26·93	152
D Guildford (Piccards Rough)	C. M. Powell, Esq. ...	5	2 0	325	23·03	125
D „ (Guildown The Beeches)	Miss Hadden	5	0 11	220 T	25·73	203
D Farnham (The Bourne Vicarage) ..	Rev. T. W. Sidebotham	5	1 0	308 A	24·41	186
D Red Hill (Beech House)	R. Barrington, Esq. ...	8	1 1	280	27·26	151
D Reigate (Woodhatch Lodge) ...	T. B. Haywood, Esq. ...	5	1 0	270 T	26·57	157
D „ (Ringley Mead)	R. L. Hesketh, Esq. ...	5	1 0	345 T	27·86	176
D Dorking (The Denbies)	Mr. J. Beesley	5	0 9	610 T	28·98	162
D Buckland (Shagbrook)	Miss Carr Saunders ...	5	1 0	240 T	26·35	170
D† Red Hill (Oxford Road)	W. H. Tyndall, Esq. ...	8	1 0	300 A	27·24	177
Reigate (Dovers Lodge)	R. W. Clutton, Esq. ...	5	0 7	192	26·53	173
D „ (Holmfels)	Miss Baker	5	1 0	264 T	27·60	161
D „ (Castle Grounds)	Mr. G. Crutchfield	5	1 0	325 A	27·69	182
D „ (Doods)	G. E. Pym, Esq.	5	1 3	350 A	28·25	181
† „ (Wray Park)	A. Rosling, Esq.	5	1 0	330 T	28·14	159
D „ (Nutwood)	H. E. Gurney, Esq. ...	5	1 4	440 T	29·28	176
D Nutfield Priory	J. Fielden, Esq.	8	1 2	468 A	25·89	174
„ (Holmesdale)	C. T. Maw, Esq.	8	0 8	500 T	25·26	160
D Reigate Hill (Lovellands)	R. Binns, Esq.	5	1 3	600 P	31·93	186
D Guildford (Wern)	Miss Mathew	5	4 0	170	22·01	140
Trevereux [Edenbridge]	C. H. Repington, Esq. .	5	0 9	...	26·24	...
D Dorking (High Ashurst)	The Hon. H. D. Ryder	5	10 0	560	26·87	152
Horsley Towers	The Earl of Lovelace ..	8	1 0	300	24·96	...
D Caterham Asylum	Dr. Elliot	5	1 0	609	30·80	157
D „ Valley (Birchwood Ho.) ..	Messrs. C. & F. Rutley	5	1 0	471 A	27·25	196
D Camberley (Heathcote)	Maj.-Gen. Stotherd C.B.	5	1 0	292 A	22·08	148
D Kenley (Ingleside)	H. Smith, Esq.	8	1 0	375 T	28·61	187
D Ashted (D'Abernon Chase) ...	Sir W. Vincent, Bart. .	5	1 0	300 T	29·80	154
D Woking (Horsell Vic.)	Rev. J. Back	5	1 0	141 A	20·41	175
D Cobham (Leigh Hill House) ...	J. Macaulay, Esq.	5	2 0	79	21·70	159
Epsom	The Meteor. Council ...	...	...	...	24·64	174
D Purley (Tudor Cot.)	F. C. Bayard, Esq. ...	5	1 0	216 A	28·11	199
„ (Reedham)	„ „ „	5	1 0	375	26·24	186
D Bagshot (Collingwood)	Mr. J. Bryan	5	1 0	396 A	23·33	190
Chobham	H. Horncastle, Esq. ...	5	1 0	90 T	21·68	163
D Chertsey (Ottershaw)	R. H. Otter, Esq.	5	1 0	200 T	20·69	203
D Weybridge Heath (Netherfield) ..	C. H. Parkes, Esq. ...	5	1 0	160	20·87	167
† „ „ (Bartropps) M	Mrs. Harrison	8	0 6	150 A	21·34	...
D „ „ (Oakfield) ...	H. Yool, Esq.	5	1 0	107 A	21·92	167
D „ „ (St. George's Lodge) ..	Mrs. Smith	5	1 9	...	21·55	...
„ „ (Church Street) ... M ..	H. Yool, Esq.	5	1 0	55 A	21·70	...
D Esher (Sewage Works)	Baldwin Latham Esq CE	5	1 0	40 A	18·42	147
„ „ (West End)	W. H. Dines, Esq.	5	1 0	51 T	21·43	...
Walton-on-Thames (Hersham) ..	„ „ „	8	4 0	55 A	22·07	168
D Addington (Hares Bank)	F. C. Bayard, Esq. ...	...	1 0	331	26·72	180
„ „ (Park Farm)	„ „ „	5	1 0	268 A	27·19	167
D Wallington	„ „ „	5	4 1	157 A	25·10	162

DIVISION II.—SOUTH EASTERN COUNTIES—(continued).

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which ·01 or more fell.
		Diameter	Height Above Ground	Height Above Sea Level	1889	
			ft. in.	feet.	inches.	
SURREY—(con.)						
†Sutton (Mulgrave Road)	W. Goode, Esq.	5	5 6	230 ∇	24·35	176
„ (Grange Road)	F. C. Bayard, Esq. ...	5	1 6	230	22·80	...
D Carshalton (The Wrythe)	„ „ „	5	4 10	107	23·13	186
Beddington	The Royal Meteor. Soc. ...	5	1 0	120	23·77	179
D Croydon (Waddon House)	P. Crowley, Esq.	5	1 0	156 ∇	23·26	180
D „ (The Whitgift)	A. E. Watson, Esq. ...	5	1 0	191	24·76	181
D „ (Dingwall Road)	G. Corden, Esq.	5	1 0	195	24·17	180
D „ (Brimstone Sew. Works)	F. C. Bayard, Esq. ...	5	1 0	130 ∇	21·87	139
*† „ (Addiscombe)	E. Mawley, Esq.	8	0 9	202 ∇	25·18	186
D Chertsey (Long Cross)	C. H. Berners, Esq. ...	8	1 9	168 ∇	21·45	161
„ (Burley Orchard)	W. Herring, Esq.	5	1 0	47 ∇	23·15	...
New Malden Sewage Works	F. C. Bayard, Esq. ...	5	1 0	45	21·26	141
D Walton-on-Thames	A. H. Hall, Esq.	5	4 6	55 ∇	21·40	142
D Surbiton (Seething Wells)	R. Hack, Esq., C.E. ...	10	0 6	25	21·07	154
D East Molesey (Palace Road)	Mrs. Jenkyns	8	6 5	37	20·96	169
Kingston Sewage Works	F. C. Bayard, Esq. ...	5	1 0	25	23·65	175
D Wimbledon	T. Devas, Esq.	12	3 0	157 ∇	24·48	162
D „ (Raynes Park)	W. S. Crimp, Esq., C.E. ...	5	1 0	47	24·81	202
D „ (Sewage Works)	„ „ „	5	1 0	58 ∇	23·20	169
Egham (Cooper's Hill)	The Meteor. Council ...	8	1 1	280	21·49	199
D Richmond (Ormond Lodge)	J. T. Billett, Esq.	5	0 9	51	24·18	181
D Kew Observatory	The Kew Committee ...	11	1 9	19 ∇	23·60	177
Brixton (Acre Lane)	The Meteor. Council ...	8	1 0	77 ∇	24·70	183
D Battersea Creek	London County Council	8	27 2	41 ∇	21·84	134
D Vauxhall Cross (Wandsworth Rd.)	„ „ „	8	30 9	48 ∇	20·14	150
KENT.						
Dungeness	The Meteor. Council ...	8	...	...	23·82	165
D Hawkhurst (Sandhurst Rec) <i>Gard.</i>	Rev. G. Ridout	5	1 3	208 ∇	27·25	150
D „ „ „ „ „ <i>Lawn</i>	„ „ „	5	1 3	206 ∇	27·27	150
D† Dymchurch (New Hall)	The late H. D. Good, Esq. ...	8	1 0	12 ∇	23·65	175
D Rolvenden (Hole Park)	A. Curteis Neve, Esq. ...	5	1 0	220	26·95	158
Tenterden (Summerhill)	Rev. A. Wilkin	12	1 0	149 ∇	25·19	152
Benenden Vicarage	Rev. Canon Joy	8	1 6	330	25·47	...
„ (East End)	J. Ellis Mace, Esq.	8	1 5	193 ∇	26·13	...
„ „ „ „ „ <i>Snowdon</i>	„ „ „	5	1 0	150 ∇	25·33	...
D Tenterden	„ „ „	8	1 5	190 ∇	27·41	201
„ „ „ „ „ <i>Snowdon</i>	„ „ „	8	1 5	190 ∇	27·05	...
„ (Ashbourne)	A. Pinyon, Esq.	5	2 8	45 ∇	26·34	...
D† Hythe	H. B. Mackeson, Esq. ...	8	0 6	12 ∇	27·17	176
† „ (Hillhurst Farm)	G. F. Deedes, Esq. ...	5	2 0	280 ∇	29·29	177
Cranbrook (Swattenden)	Miss Appach	8	1 2	350 ∇	25·51	161
† „ (Hartley)	G. Pile, Esq.	5	4 0	405 ∇	26·93	187
† Hythe (Paddlesworth)	Mr. R. Dixon	8	1 0	608 ∇	34·95	...
D† Dover (Pencester Street)	H. J. Poulter, Esq. ...	5	2 0	32	26·55	158
„ (Randolph Gardens)	Capt. Parker, R.N. ...	5	1 6	100	29·38	...
D† Acrise (School Ho.)	G. C. Woollett, Esq. ...	8	1 0	504 ∇	34·37	237
D Tunbridge Wells (Camden Park)	J. Weston, Esq.	5	0 9	424 ∇	30·92	194

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain. 1889	Days on which -01 or more fell.
		Diameter	Height Above Ground	Height Above Sea Level		
			ft. in.	feet.	inches.	
KENT—(con.)						
Tunbridge Wells (Bredbury) ...	F. G. Smart, Esq.	...	...	...	30·28	176
" " (Ferndale)	A. Keene, Esq.	8	1 0	370 T	32·73	162
Cranbrook (Camden Lodge)	Mr. A. Habbitts.....	5	1 0	276 T	25·95	150
Ashford (Bethersden)	W. H. Mold, Esq.	5	4 0	112 T	26·12	193
" (Beavor Green)	T. Nickalls, Esq.	5	1 0	155 T	29·39	192
Tunbridge Wells (Etherton Hill)	E. W. Winton, Esq....	5	1 5	276 T	27·91	130
" " (Pembury) ...	W. Brentnall, Esq. C.E.	8	1 8	181 T	26·79	151
Tunbridge (Penshurst Place) ...	The Hon. H. Sidney...	5	0 10	115	27·10	...
" " (Park).....	Mr. J. M. Sturgess ...	5	0 4	265 T	27·50	163
" " (St. Mary's).....	W. C. Punnett, Esq....	5	1 6	96 T	28·28	167
" " " } Snowdon	" " "	5	1 0	96 T	27·69	167
" " " } M	" " "	8	4 0	98 T	27·02	...
Shepherdswell (Hazlingdene) ...	F. A. Mackinnon, Esq.	8	0 8	300	27·53	...
Ashford (Eastwell Rectory)	Rev. G. E. Gwynne ...	5	0 11	270 T	27·93	...
" (Westwell)	Rev. H. H. D'Ombraim	5	1 0	272 T	29·70	160
Edenbridge (Falconhurst)	J. G. Talbot, Esq., M.P.	5	1 0	300	28·42	111
Lower Walmer	Mr. H. R. Botting.....	5	1 4	20	23·89	157
Maidstone (Hunton Court)	Mr. P. Goddard	8	0 6	80 T	23·24	156
" (Linton)	Mr. C. Pratt	5	3 2	...	24·13	154
" (Mote Park).....	Mr. C. Davies.....	10	3 6	95 ?	25·82	188
" (Mount House)	C. A. Case, Esq.....	5	1 0	170 ?	28·27	190
" (Hospital).....	M. A. Adams, Esq. ...	5	0 8	200	22·78	136
" (Debting)	R. Cooke, Esq.	5	1 2	330 T	29·84	217
Sheldwich	Rev. B. S. Malden.....	5	1 0	250 T	30·31	173
Selling (Harefield).....	E. Neame, Esq.	5	2 6	217 T	30·03	211
Canterbury (Burgate Street) ...	B. Rigden, Esq.....	5	9 6	58 T	23·78	144
" (Harbledown)	Miss Metcalfe.....	5	1 6	165 T	22·83	176
Seven Oaks (River Hill)	J. T. Rogers, Esq.....	8	3 6	535 T	26·87	101
" (Clare Bank)	J. M. Clabon, Esq.	5	4 0	540 T	27·79	181
" (Purleigh)	W. W. Wagstaffe, Esq.	6	1 5	330	32·05	188
" (Riverhead Vic.) ...	Rev. J. M. B. Murdoch	5	0 6	300 T	26·93	157
" (Chevening Gardens)	Mr. C. Sutton	5	1 0	360	27·13	...
Aylesford (Preston Hall)	Mr. A. Waterman.....	5	1 6	80	26·39	...
Sittingbourne (Sharsted Court).	Faunce de Laune, Esq.	5	1 0	276 T	29·67	177
Lynsted (The Batteries)	R. M. Mercer, Esq. ...	5	1 0	140	26·13	172
Ospringe (Lorenden)	W. C. Stunt, Esq.....	5	1 3	180 ?	24·59	157
Knockholt (Kent Waterworks)..	F. C. Bayard, Esq.	...	...	...	29·31	...
Keston (Bradfield)	A. Hil, Esq.	5	1 0	350 T	25·93	180
" (Heathfield)	Miss Holland	5	0 6	420 T	28·96	239
" ") M	" " "	5	0 6	420 T	29·20	...
" Tower.....	G. Buchanan, Esq., C.E.	8	0 11	351 T	28·43	181
Ramsgate (The Vale)	M. Jackson, Esq.	5	1 0	90 T	24·62	173
Birchington	E. S. Lendon, Esq.....	5	1 10	45	22·45	134
Herne Bay (Eddington)	R. M. Mercer, Esq. ...	5	1 0	4 ?	21·28	...
Reculver (Brook)	A. Collard, Esq.....	5	6 3	40	20·58	155
Hayes (Layham's Farm)	W. Ashcroft, Esq.....	5	1 0	500	29·00	182
" Common (The Warren)...	Miss Akers	5	1 0	296	26·99	189
Orpington (Kent Waterworks)...	F. C. Bayard, Esq. ...	5	1 0	220	26·39	142

DIVISION II.—SOUTH EASTERN COUNTIES—(continued).

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain. 1889	Days on which ·01 or more fell
		Diameter	Height Above Ground	Height Above Sea Level		
			ft. in.	feet.	inches.	
KENT—(con.)						
Chatham	The Meteor. Council....	8	1 3	137	25·51	168
D Rochester (Knights Place)	J. Pye, Esq.	5	2 6	320	26·83	171
D Margate (Renfrew Villa)	T. Twyman, Esq.	5	1 0	50 †	23·54	173
D „ (Apsley House)	J. Stokes, Esq.	5	1 0	84 †	22·78	168
„ „ „	„ „ „	5	...	84 †	22·82	167
Sheppey (Greenborough)	R. M. Mercer, Esq. ...	5	...	...	27·59	106
„ (Leysdown)	Rev. A. Farbrother ...	5	1 2	47	22·58	185
D Frindsbury (Manor Farm)	Mr. F. Baker	5	1 0	100	23·62	153
Bickley (Highfield)	J. Batten, Esq.	5	1 2	295	26·31	...
„ (The Pines)	C. Boosey, Esq.	5	1 0	200	26·73	103
Chislehurst (Abbey Lodge)	Col. Silver	5	1 5	...	24·80	137
D „ (The Chestnuts)	J. B. Snell, Esq.	5	1 0	325 †	25·70	188
D Wilmington (Kent Waterworks)	F. C. Bayard, Esq. ...	5	1 0	25	24·98	170
D† Beckenham (Foxgrove)	Percy Bicknell, Esq. ...	5	0 6	142 †	24·12	165
D† „ „ „	„ „ „ „ „	5	4 0	145 †	23·29	162
D Rochester (Abbot's Court, Hoo.)	Warwick Stunt, Esq....	5	1 0	10	23·25	172
D Forest Hill (Newfield House) ...	F. C. Bayard, Esq. ...	5	1 0	220	23·29	163
D Gravesend (Park Place)	Mrs. Walker	5	1 0	24?	20·21	185
D Rochester (Cooling Castle)	W. Wood, Esq.	5	4 10	10	24·08	140
D „ (Hoo St. Mary)	H. Pye, Junr., Esq. ...	5	5 6	146 †	23·07	190
Sydenham (Longton Grove)	J. Porter, Esq.	8	4 6	220 †	25·53	176
D Eltham (Victoria Road)	Capt. M. S. Richardson	5	0 8	205 †	27·46	199
Blackheath	J. Glaisher, Esq., F.R.S.	8	1 0	150	22·81	...
„ (Westcombe Park Rd.)	Rev. W. H. R. Soames	8	1 4	135	23·72	...
„ Park (Elmsdale) ...	C. Lethbridge, Esq. ...	5	0 11	90	24·03	183
Greenwich (Royal Observatory) ..	W. H. Christie, Esq. FRS	8	0 5	155 †	23·28	159
D Deptford (Kent Waterworks) ...	F. C. Bayard, Esq. ...	5	1 0	20	21·32	159
D „ (Pumping Station)	London County Council	10	1 6	5	26·32	160
Woolwich (Powis Street)	Mr. J. G. Waller	5	30 0	65	25·33	169
Erith (Crossness)	London County Council	14	1 0	16 †	22·82	164
„ („)	„ „ „ „ „	14	1 0	24 †	23·12	164
WEST SUSSEX.						
D Bognor (Lidsey Lodge)	H. Neale, Esq.	8	1 2	...	26·35	137
D Littlehampton (Surrey House) ...	G. Neame, Esq.	5	1 8	20 †	23·86	130
D Worthing (Heene)	W. J. Harris, Esq. ...	8	1 0	34 †	23·92	159
„ (Infirmary)	„ „ „ „ „	5	1 0	22	23·39	144
D Arundel (Yapton)	W. A. Hounsom, Esq..	5	1 0	24 †	27·08	145
„ „ (Drove Farm).	„ „ „ „ „	5	1 0	14 †	25·80	160
Angmering	Rev. J. B. Orme	5	1 3	...	25·05	...
Chichester (Westgate Meadow) ...	Dr. Tyacke	8	0 6	40	25·27	120
D Arundel (Clapham Rectory) ...	Rev. A. H. S. Barwell	5	1 0	150 †	26·82	189
„ (Patching)	J. Drewitt, Esq.	5	1 0	180	26·34	165
D „ „ „	Mrs. Joad	5	0 10	130	25·76	171
D „ (The Parade)	R. Holmes, Esq.	8	3 1	75	27·31	129
„ (Dale Park)	Mr. E. Sandford	5	0 11	320	26·32	...
Funtington (Ratham)	W. Jeffery, Esq.	5	0 3	18?	25·38	124
Bramber (Maudlin)	Mr. H. J. Hide	5	1 0	80	26·29	103

DIVISION II.—SOUTH EASTERN COUNTIES—(continued).

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which ·01 or more fell
		Diameter	Height Above Ground.	Height Above Sea Level	1889	
			ft. in.	feet.	inches.	
WEST SUSSEX—(con.)						
D† Steyning	Col. Ingram	5	1 0	80 T	29·88	127
Chichester (Eartham House) ...	Sir P. Milbanke, Bt. ...	3	4 6	230 T	26·12	...
„ (Selhurst Park) ...	C. O. Newman, Esq. ...	5	...	300 T	30·05	141
D „ (West Dean)	Mr. G. Broomfield.	5	1 6	190 T	36·09	145
D „ (Singleton Rectory) ...	Rev. F. A. Bowles.	5	1 0	240	33·89	120
† „ (Chilgrove)	J. W. Woods, Esq. ...	5	0 6	284 T	29·70	...
D Compton [Petersfield]	Rev. H. M. Langdale. ...	5	1 0	255 T	34·49	165
† Petworth Rectory	Rev. C. Holland	5	4 0	180 T	28·35	141
Midhurst (Lynch Farm)	G. Eames, Esq.	5	0 6	160 T	33·50	...
† Horsham (Leonardslee)	Mr. Ford.	5	1 6	273 T	27·66	...
„ (Manor House)	H. Padwick, Esq.	8	0 10	140 T	25·15	130
D „ (Wimblehurst)	Miss Edith Allcard ...	...	3 8	220 T	26·75	145
„ (Rusper Rectory)	Rev. G. A. Rideout ..	5	1 0	400 T	27·08	141
D „ („ Old Park) ...	A. F. Parbury, Esq. ...	5	1 0	372 T	28·51	141
EAST SUSSEX.						
Beachy Head	M Miss Brodie Hall	5	1 0	495 T	24·51	...
D Eastbourne (East Dean)	E. W. Adamson, Esq. ..	5	1 0	180	24·95	157
D „ (Wilmington Square) ..	R. Sheward, Esq.	8	0 6	39	30·21	156
D† „ (Osborne House) ...	Miss Brodie Hall	5	4 3	30 T	28·89	184
D† „ (The Gore)	„ „ „	5	1 0	85 T	25·88	154
D† „ (Cemetery)	„ „ „	5	4 0	160 T	26·96	157
† Brighton (Kemp Town)	Mr. Wyatt	5	1 0	82 T	25·49	149
† „ (Old Steine)	Dr. Newsholme ..	5	0 8	32	27·45	153
† „ (Blatchington Road) ...	Mr. J. Park	8	0 6	55 T	25·76	...
D „ (Prestonville Road) ...	H. Phillips, Esq.	5	1 0	185	25·67	149
„ („ „ „) M	„ „ „ „	...	...	185	25·09	...
„ (W.W. Goldstone Botm.)	J. Baker, Esq.	5	0 10	140 T	25·11	...
† „ („ Lewes Road) ...	„ „	5	3 8	105 T	28·88	...
St. Leonards (London Road) ...	The Meteor. Council ...	5	1 0	166 T	26·92	181
D „ (The Grove)	W. B. Young, Esq. ...	5	1 1	110 T	26·15	170
D† Hastings (Buckshole)	P. H. Palmer, Esq.	8	0 8	106	27·36	163
D Hailsham	Rev. F. Clyde Harvey..	5	1 0	105	27·92	132
D† Falmer	R. R. Verrall, Esq. ...	5	3 0	312 T	30·88	133
D Lewes (Iford)	A. Hillman, Esq.	5	1 0	33 T	30·92	167
D† „ (Glynde Place)	Mr. W. McLeod	5	4 6	49 T	30·01	158
D „ (Bedford Lodge)	Mrs. Kemp	5	1 0	100 T	25·28	160
D „ (Southmalling)	Miss M. H. Rickman..	5	0 10	40 T	23·88	160
† Hastings (High Beech Hollington)	Col. Lewis	5	1 0	320 T	23·73	175
„ (Beauchamp „ „)	C. L. Christian, Esq. ...	8	1 2	...	25·38	...
Lewes (Conyborough Park)	Lord Monk Bretton ..	...	...	...	32·84	...
D Hurstpierpoint (Danny Park) ..	Mr. J. Bunney	...	1 3	...	29·78	127
D Winchelsea (The Friars)	Miss Stileman.	5	1 2	115 T	21·86	147
Battle (Whatlington)	F. Gripper, Esq.	5	1 3	...	26·36	195
D Warbleton (The Rectory)	Rev. R. G. Penny	5	1 1	182	28·49	173
D† Waldron (Heatherden House) ...	J. G. Boucher, Esq. ...	5	1 3	476	29·93	145
† „ (Bryckden)	J. Graham, Esq., M.D.	5	1 0	320 T	30·07	...
† „ („ „)	„ „ „	8	1 0	320 T	29·86	...

DIVISION II.—SOUTH EASTERN COUNTIES—(continued).

STATIONS.	AUTHORITIES.	Diameter	Rain Gauge.		Height above Sea Level	Depth of Rain.	Days on which ·01 or more fell.
			Height above Ground.	Height above Sea Level		1889	
EAST SUSSEX—(con.)							
D Burgess Hill (Prescott).....	W. T. Reynolds, Esq..	5	1	0	...	25·31	147
Wivelsfield (Lyoth)	T. P. Descow, Esq. ...	5	1	1	...	27·03	...
D Newick (Ketches)	Capt. G. Ruck Keene, RN	8	0	7	192 T	24·36	118
„ (Beechlands)	T. St Leger Blaauw, Esq	5	1	1	...	28·94	145
D Uckfield House	Miss L. Day	8	0	8	200 B	27·53	165
D Cross in Hand (Montpellier).....	A. Brown, Esq.	5	3	4	475	30·14	143
D† Maresfield (Forest Lodge).....	Capt. W. Noble	8	1	2	247 T	29·80	201
D† Fletching	Dr. Treutler	5	1	0	140	28·15	170
D Cuckfield (Borde Hill House) ...	Mr. R. Inglis	5	3	0	270 B	28·42	162
„	The Meteor. Council ...	...	...	...	...	28·01	163
D† Mayfield Vicarage	Rev. H. T. M. Kirby...	8	0	8	425 T	30·47	158
D† Crowborough (The Observatory).	C. L. Prince, Esq.	8	0	8	777 T	34·88	169
D Balcombe Place	B. A. Hankey, Esq. ...	8	1	3	289 T	30·45	177
D „ (Highley Manor)	R. C. Nichols, Esq. ...	8	1	6	422 T	28·85	124
D Ticehurst	Mr. Backhouse	8	4	9	423 T	27·46	124
D Wadhurst (Lower Cousley Wood)	F. Wilkin, Esq.	5	1	0	416 T	27·34	175
Frant (Eridge Castle)	Mr. J. Rust	5	1	0	400	32·14	172
D Withyham (Leyswood)	Mr. T. Moorhouse	8	1	4	420	32·61	155
Forest Row (Ashdown Cottage)..	H. J. Slack, Esq.	8	3	6	386 B	27·79	...
Worth Rectory (<i>West gauge</i>) ...	Rev. G. W. Banks ...	5	4	6	309 T	27·08	176
„ „ (<i>East gauge</i>) ...	„ „ „ „	5	1	10	300 T	29·03	...
D East Grinstead (Old Stone House)	P. E. Wallis, Esq.	5	4	0	448 T	29·81	163
„ „ (Halsford Park). ..	W. V. K. Stenning, Esq.	5	1	3	365 T	29·14	156
HAMPSHIRE.							
ISLE OF WIGHT.							
Ventnor (Consumption Hospital)	Mr. H. Sagar	5	1	0	75 T	25·31	150
Shanklin (Bondi)	A. Parbury, Esq.	5	1	0	150	29·81	...
D Sandown (Lake Hill)	W. E. Green, Esq. . . .	5	1	0	105	24·89	132
Brading	Rev. E. Summers	5	1	6	60	21·17	...
D Newport (Lugley House)	Rev. E. W. Watts ...	5	1	0	...	28·34	163
D Yarmouth (National School) ...	Mr. F. C. Spray	5	1	0	8	23·64	153
Ryde (Thornbrough)	Col. Clarke	5	1	0	143 T	28·52	...
D „ (Town Hall)	F. Newman, Esq.	8	1	0	83 T	25·41	172
Wootton (Fernhill)	F. Brodie, Esq.	8	0	6	118 T	27·34	...
D† Osborne (Newbarn Cottage)	J. R. Mann, Esq.	8	0	8	172 T	24·08	164
West Cowes (Holmwood)	C. T. Maw, Esq.	8	0	8	40 T	23·33	177
Hurst Castle	The Meteor. Council ...	8	0	11	9	26·39	169
Bournemouth (Queen Anne Gdns.)	Mr. W. Searle	5	0	4	150	26·77	148
Christchurch (South Bourne) ...	Dr. Compton	5	1	0	91	23·74	160
D „ (Mudford)	F. H. D. Eyre, Esq. ...	5	0	3	15 L	24·97	190
D „ (Kenilworth)	J. H. Bridgford, Esq. .	5	1	2	100 ?	23·49	168
D Lymington (Pennington)	Miss E. Lomer	5	0	9	96 T	26·79	168
D Portsmouth (Fort Cumberland)..	H. P. Boulnois, Esq. C.E.	8	1	0	24	19·97	122
D „ (Closewood, Cosham)	O. Philpott, Esq.	5	0	9	125 T	25·09	149
D Havant (Farlington)	H. R. Smith, Esq., C.E.	5	1	0	77 T	23·05	155

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which .01 or more fell.
		Diameter	Height Above Ground	Height Above Sea Level	1889	
			ft. in.	feet.	inches.	
HAMPSHIRE—(con.)						
Havant (Farlington)	M H. R. Smith, Esq. C.E.	5	1 0	77 T	23·07	...
D "	" " "	5	1 0	25 T	24·96	131
"	M " " "	5	1 0	25 T	25·05	...
D Emsworth (Redlands)	F. Jacomb Hood, Esq.	5	1 0	90 T	26·67	157
D Southampton (Cadland)	J. Laurie, Esq.	8	4 6	52 T	28·64	170
D " (Netley)	Prof. J. Lane Notter ...	8	0 5	37 T	26·78	171
" (Ordnance Surv. Off.)	Col. Sir C. Wilson, FRS.	5	1 0	79 T	25·42	162
D Wickham (West Lodge)	Rev Stanhope Rashleigh	5	0 11	315 T	26·77	151
D Botley (Hall Court)	Adml. Murray-Aynsley	8	0 7	108	26·26	151
Horndean (St. Catherines)	Miss Barnes	8	1 7	417 T	30·75	167
D Idsworth House	Mr. N. F. Fuller	5	1 0	300 T	31·07	112
Southampton (Millbrook)	A. Spooner, Esq.	5	1 1	10	25·49	...
D " (Westend)	C. Purrott, Esq.	5	1 6	244 T	28·93	171
D* " (Highfield) <i>Snowdon</i>	Rev. H. Garrett	5	1 0	130 T	26·20	171
" ()	M " " "	5	1 0	130 T	26·54	...
D† " (Red Lodge)	R. C. Hankinson, Esq..	5	0 6	206	25·47	163
" ()	M " " "	5	4 0	200 T	26·48	...
D Fordingbridge (Oaklands)	T. Westlake, Esq.	8	1 0	135 T	27·07	142
Bishops Waltham (Swanmore House)	W. H. Myers, Esq.	8	1 0	390 T	28·40	118
Droxford (Fir Hill)	Rev. S. King	5	1 0	212	28·05	177
Fordingbridge (Wood Green) . .	H. Hinxman, Esq.	5	1 2	140 T	28·72	...
Petersfield (Liss Place)	F. Coryton, Esq.	7	0 7	250 T	28·42	...
D Alresford (Cheriton Rectory) ..	Rev. A. Orr	5	2 0	240	27·72	149
" (Ropley)	Rev. T. Woodhouse ...	5	1 0	375 T	26·99	126
D " (Ovington)	Rev. A. H. Stocker ...	5	5 1	225 T	27·34	178
D Alton (East Tisted Rectory)	Rev. F. Howlett	5	1 1	420 T	31·56	156
D " (The Wakes, Selborne) ..	General Parr	5	5 3	400	30·20	150
D Winchester (Harestock)	Col. Knight	5	1 0	302 T	27·64	181
Liphook (White Hill Chase) ..	Col. R. H. Maude	5	1 0	300 T	28·93	110
D Alresford (Swarraton Rectory) ..	Rev. W. L. W. Eyre ...	5	1 0	310 T	25·03	156
Alton (Thedden Grange)	J. G. Wood, Esq.	8	1 3	600 T	30·85	...
D† " (Ashdell)	F. Crowley, Esq.	8	3 6	433 T	28·04	152
Micheldever (Northbrook)	J. A. Caird, Esq.	5	1 1	270 T	28·22	...
Whitchurch (Long Parish)	C. Durnford, Esq.	...	...	...	24·23	165
Andover (The Knoll)	G. H. Westbury, Esq..	6	0 10	196 T	23·99	181
Tedworth House [Ludgershall] ..	Mr. G. A. Inglefield ...	8	1 8	357 T	27·89	153
D Aldershot	D. T. Livesey, Esq. ...	5	1 0	250 T	23·65	158
D Basingstoke (Chapel Hill)	G. Stephens, Esq.	5	1 0	328 T	24·13	180
D Fleet (Claremont House)	Miss L. Pasley	8	2 0	280	24·33	155
D Basingstoke (Monk Sherborne) ..	Rev. Canon Willes ...	5	1 6	314 T	24·50	158
D† " (Sherborne St. John)	Rev. D. W. Chute	5	1 2	267 T	24·98	198
Farnborough (The Grange)	Major Holt	5	1 0	232 T	26·48	172
Kingsclere (Ramsdale)	Miss A. F. Fuller	5	1 0	341 T	25·28	145
Hartley Wintney	Mr. W. G. Machin ...	5	1 2	210	21·74	153
" Grange	W. Walkinshaw, Esq..	5	1 0	220 T	20·71	...
" Wespall	Rev. J. C. Keate	8	0 9	233 T	21·52	...
Bramley	Rev. C. Eddy	8	0 9	230 T	24·15	...
D† Strathfield Turgiss	Rev. C. H. Griffith	5	3 0	200 T	22·96	191
Heckfield (Park Corner)	J. Martineau, Esq.	5	1 2	257	20·56	...

DIVISION III.—SOUTH MIDLAND COUNTIES.

D Southgate (The Lawns).....	G. A. Church, Esq. ...	5	0	6	240 T	27-47	173
D Rickmansworth (Moor Park).....	Rt. Hon. Lord Ebury ..	5	2	0	340	29-02	184
Bushey Heath.....	Forrester Scott, Esq... 5	0	10	480	28-49	168	
D† Watford (Oaklands).....	E. Harrison, Esq. 5	5	6	273 T	26-76	182	
Barnet (Gas Works)	<i>Registrar Gen. Ret.</i> ...	...	...	212	25-56	145	
D Cheshunt Old Nurseries.....	Messrs. Paul & Son ... 5	1	0	92 T	26-80	127	
D „ College	Rev. Dr. Reynolds..... 5	1	1	94	27-68	142	
D Broxbourne (Stafford House) ...	G. J. Newbery, Esq.... 5	1	0	118 T	28-28	192	
D Hemel Hempstead (Nash Mills)..	Messrs.JD Dickinson&Co. 12	3	9	237 T	27-62	151	
D St. Albans (The Grange)	J. Hopkinson, Esq. ... 5	1	0	380 T	29-45	186	
D „ (Torrington House)..	Miss E. A. Ormerod ... 5	1	0	271 T	28-19	183	
„ „ „ „ M	„ „ „ „ „	5	1	0	271 T	27-49	...
† „ „ „ „	Rt. Hon. Earl Verulam 6	2	6	425 T	26-71	...	
D Great Berkhamstead (Rosebank)	E. Mawley, Esq. 8	1	0	401 T	26-87	190	
„ „ „ „ M	„ „ „ „ „	8	1	0	401 T	26-62	...
D „ „ „ „	Rev. W.Tyrwhitt Drake 8	1	0	426 T	27-28	178	
Hertford (Bayfordbury)	W. C. Baker, Esq..... 8	1	2	250	28-03	167	
„ „ (Marden Hill, Tewin). Mr. R. L. Hoare	6	0	6	260 T	30-53	130	

DIVISION III.—SOUTH MIDLAND COUNTIES—(continued).

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which -01 or more fell.
		Diameter	Height Above Ground	Height Above Sea Level		
			ft. in.	feet.	1889	inches.
HERTS—(con.)						
d Tring Vicarage	Rev. W. Quennell	5	1 0	442 T	29·23	180
Harpenden (Rothamstead)	Messrs. Lawes & Gilbert	5	0 9	420 T	29·42	168
" " " " " "	" " " " " "	8	0 9	420 T	29·13	164
d Welwyn (Brocket Hall)	Mr. T. Landon	8	1 0	...	28·25	138
d Ware (Red House)	J. Francis, Esq., C.E.	12	3 0	114 T	26·38	169
d " (Fanham's Hall)	Miss Joyce Croft	8	1 0	253 T	27·26	187
Welwyn (Danesbury)	A. M. Blake, Esq.	5	0 9	405 B	30·36	157
d " (Datchworth Rectory) ..	Rev. J. Wardale	5	1 0	386 T	25·63	162
d Ware (Much Hadham)	T. W. Mott, Esq.	5	1 0	222 B	27·17	164
d Kensworth [Dunstable]	Miss Jones	5	1 0	630 B	30·76	152
d Bennington Lodge	Rev. Dr. Parker	5	1 0	408 T	29·15	210
d Buntingford (Hamels Park)	Mr. E. Wallis	5	1 0	400 T	27·01	142
d† Hitchin (Wratten)	W. Lucas, Esq.	5	2 1	238 T	24·73	176
d " (Fairfield)	F. Ransom, Esq.	5	1 5	282 T	25·55	205
" (The Maples)	W. Hill, Esq.	8	1 2	220 T	22·70	...
" (Bancroft)	L. W. Gatward, Esq. ...	5	1 6	215	25·46	...
" (High Down)	J. Pollard, Esq.	5	1 1	422 T	27·98	160
d Buntingford (Throcking Rectory)	Rev. C. W. Harvey ...	5	1 0	484 T	25·57	165
d Stevenage (Weston Manor)	M. R. Pryor, Esq.	5	0 7	480 T	26·39	173
d Royston (Therfield Rectory)	Rev. J. G. Hale	5	4 3	500 P	26·80	169
d† "	H. Wortham, Esq.	8	0 6	269 T	24·41	158
BUCKINGHAMSHIRE.						
d Slough (Langley)	R. H. Major, Esq.	8	0 10	85 T	20·87	163
" (Upton Park)	G. Bentley, Esq.	5	3 0	90 T	20·61	176
d Taplow Court	Mr. W. Williams	8	1 0	217	20·77	169
d Burnham (The Elms)	G. J. Williams, Esq. ...	5	3 0	182	20·09	119
Greenlands [Henley-on-Thames] ..	Rt. Hon. W. H. Smith M.P.	8	1 3	116	27·07	113
d Great Marlow	J. Ford, Esq.	8	1 3	...	25·75	154
" " (Cromwell House) ..	E. Clark, Esq., C.E. ...	5	2 0	97 T	24·09	...
High Wycombe ..	H. S. Wheeler, Esq. ...	8	0 9	253 T	22·87	...
Aylesbury (Serena Terrace)	J. Copcutt, Esq.	12	1 0	280 T	28·80	...
" (Mentmore)	J. Smith, Esq.	5	1 6	...	23·85	...
d† Winslow (Addington Manor) ...	Rt. Hon. Lord Addington	8	1 0	309 T	25·52	170
d† Buckingham (Adstock)	J. E. S. Weston, Esq. ...	5	0 9	350 T	25·50	160
d Stony Stratford (Thornton)	Mr. W. Sturdy	5	1 6	...	22·46	137
Woburn Sands (Sandymount)	C. P. Stuart, Esq.	5	1 4	...	24·62	174
d Newport Pagnell	R. Littleboy, Esq.	5	2 0	196 T	22·44	153
Olney (Filgrave Rectory)	Rev. J. Tarver	8	0 8	280	23·78	137
OXFORD.						
d Whitchurch Rectory	Rev. J. Slatter	12	1 0	150 T	21·93	162
Henley-on-Thames (Greys)	Rev. N. Pinder	5	1 8	370 T	24·46	...
d " " (Assenton)	Mr. J. Ratty	5	1 0	281	25·48	162
d Dorchester ..	Col. Blunt	5	2 0	169	19·14	160
d Abingdon (Culham)	Rev. F. C. Clutterbuck	5	1 0	200 T	22·49	157
d Watlington (Pyrton)	Cecil Hamersley, Esq. ...	5	1 0	351	26·44	159
d Abingdon (Nuneham Park)	E. W. Harcourt, Esq. ...	8	3 0	280	23·73	195

DIVISION III.—SOUTH MIDLAND COUNTIES—(continued).

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain. 1889	Days on which -01 or more fell.
		Diameter	Height Above Ground	Height Above Sea Level		
			ft. in.	feet.	inches.	
OXFORD—(con.)						
Thame (Aston Rowant).....	T. Taylor, Esq.	8	1 0	385 N	26·20	...
D Oxford (Potlands, Baldon) ...	Miss Clinkard.....	5	1 0	288	23·23	175
D „ (Rose Hill, Iffley)	E. Cobb, Esq.....	4	4 0	269	27·01	122
D† „ (Mag. Coll. Laboratory) ..	E. Chapman, Esq.	5	1 0	186 N	22·24	166
„ { „ „ „ } ..	E. J. Stone, Esq., F.R.S.	5	33 11	223 N	20·43	...
„ { „ „ „ } ..	„ „ „	8	1 8	210 N	23·53	165
D „ { „ „ „ } ..	„ „ „	11	2 4	210 N	24·73	145
„ { „ „ „ } ..	„ „ „	10	22 0	230 N	22·93	150
„ { „ „ „ } ..	„ „ „	10	112 0	320 N	16·17	170
D „ (St. Giles')	A. R. Tawney, Esq. ...	8	1 6	210 N	24·35	177
D „ (Norham Road).....	Rev. C. B. Mount	10	1 2	220 P	23·73	154
D „ (Elsfield)	H. Parsons, Esq.	6	1 0	330	23·38	188
Stanton St. John's... ..	Miss Thomson.....	8	1 0	340	21·77	172
„ „ „ (Woodperry) ..	J. Thomson, Esq.	6	1 0	399 T	22·97	185
Chipping Norton (Kingham).....	E. Lockwood, Esq. ...	5	4 0	442	27·75	...
Bicester (Middleton Park)	Mr. B. Hope	5	2 6	380	26·03	181
Steeple Aston.....	B. S. Ogle, Esq.	5	0 3	400 T	29·48	185
D „ „ (The Grange).....	Adl. Bradshaw, C.B....	8	1 0	400 T	28·69	180
D Banbury (Bloxham Grove)	Rev. G. Warriner	8	3 10	387 N	26·01	150
D „ („)	Col. O. Ommañney ...	8	2 6	400 T	26·33	170
D „ (Cotefield, Bodicote) ..	T. E. Cobb, Esq.	8	2 0	383 N	25·18	182
D „ (Swalcliffe Vicarage)...	Rev. Dr. Wilkinson ...	8	1 0	520	28·15	175
D „ (Ark House School) ...	A. J. Beale, Esq.	5	1 0	310	24·92	173
NORTHAMPTON.						
Brackley	Mr. E. Durran	8	6 10	400 T	28·16	147
Grimsbury [Banbury] ..	W. H. Hathaway, Esq.	5	1 3	320 T	26·40	164
Thorpe Mandeville [Banbury] ..	Mr. S. Baines	5	1 0	530	27·23	153
D Towcester (Whittlebury)	W. S. Miller, Esq.....	5	1 6	350	28·60	182
D „	P. Phipps, Esq.	5	1 0	290	25·99	160
„ (Easton Neston)	Mr. E. Slarke.....	8	1 0	340 T	26·49	178
D Stoke Bruerne Rectory.....	Rev. W. Wilson... ..	8	1 0	320 T	23·47	182
Blisworth	C. A. Markham, Esq ...	...	...	...	25·80	138
D Litchborough	E. Grant, Esq.	5	1 1	...	28·74	185
Northampton (Preston Deanery).	C. A. Markham, Esq... ..	5	1 0	...	22·13	182
D Daventry (Fawsley)	Lady Knightley	5	1 0	477 B	26·96	180
D Castle Ashby	R. G. Scriven, Esq. ...	5	1 0	263 N	24·22	171
D Northampton (Little Houghton).	Mr. J. Brawn.....	5	2 4	...	23·78	176
D „ (Hazlewood Road) ..	H. Terry, Esq.	5	5 0	253	22·77	159
„ (Gold Street)	Mr. S. Law.....	5	6 6	230 N	22·52	163
„	C. A. Markham, Esq... ..	...	...	...	23·39	176
D Great Brington (Althorp House)	C. S. Groom, Esq.	8	3 10	310 N	24·68	170
D Pitsford (Sedgebrooke)	C. A. Markham, Esq... ..	5	1 0	311 N	23·62	172
„ („)	„ „ „	5	1 0	311 N	23·45	...
D Daventry (Waterloo).....	F. F. Rodhouse, Esq... ..	5	1 3	436 N	28·10	196
Earls Barton Vicarage	Rev. R. R. Cobbold ...	5	1 4	280 T	22·45	202
Wellingborough (Swanspool) ...	N. P. Sharman, Esq. ...	5	0 2	155	24·11	...
D „ (Croyland Abbey) ..	E. Sharman, Esq.	5	0 3	...	25·26	180

DIVISION III.—SOUTH MIDLAND COUNTIES—(continued).

STATIONS.	AUTHORITIES.	Rain Gauge			Depth of Rain.	Days on which ·01 or more fell.
		Diameter	Height Above Ground	Height Above Sea Level	1889	
			ft. in.	feet.	inches.	
NORTHAMPTON—(con.)						
D Thrapstone (Hargrave)	Miss Baker	5	1 0	219 T	24·73	158
D Ravensthorpe (Coton Mill)	G. S. Eunson, Esq. ...	5	1 0	360	25·99	166
Thrapstone (Woodford)	C. A. Markham, Esq. ...	...	...	...	22·70	163
Hazelbeach Hill	Mrs. Pell	5	3 0	566 T	27·61	158
D Kettering	J. Wallis, Esq.	8	1 3	300 T	24·21	143
D "	C. W. Lane, Esq.	5	0 9	280	24·32	189
Rothwell	J. More, Esq., M.D. ...	12	1 2	300	23·15	138
D Oundle (Pilton Rectory)	Rev. F. G. Hodgson ...	5	1 0	130	24·46	170
D "	J. M. Siddons, Esq. ...	5	4 6	105 T	23·68	132
D Rockingham Castle	Mr. H. Watt	5	2 6	400 L	26·64	138
Peterborough (Longthorpe)	C. I. Strong, Esq.	...	...	...	24·01	...
D Easton [Stamford]	Mr. H. Watkins	5	0 11	271 T	24·41	186
D Maxey Vic. [Market Deeping]	Rev. W. D. Sweeting ...	5	1 0	32 T	22·66	189
" " [" "] M	" " "	5	1 0	32 T	22·63	...
HUNTS.						
St. Neots (Tetworth Hall)	Miss Kaye	5	0 8	190 T	29·83	192
D " (Waresley Park)	Lady C. Duncombe ...	5	0 11	...	26·36	150
Huntingdon (Brampton)	Miss May Bird	...	...	...	26·55	...
D Alconbury	Rev. R. Conway	5	1 0	...	22·84	167
Wistow	Rev. Canon Woodruff..	5	1 1	39 T	24·51	147
Whittlesea Mere	R. Lunn, Esq.	8	1 0	...	24·83	179
BEDFORD.						
Luton (Pumping Station)	W. H. Leete, Esq.	5	1 0	344 T	29·54	180
Amptill (Silsoe)	H. Trethewy, Esq.	5	1 0	214 T	28·67	149
" (Wrest Park)	Mr. G. Ford	5	1 1	...	27·19	...
D† Aspley Guise (Oaklands)	E. E. Dymond, Esq. ...	5	1 0	410 T	22·17	168
Woburn (Experimental Farm)	Mr. F. E. Fraser	8	4 0	...	23·67	...
D Stotfold [Baldoek]	Dr. Swaine	5	1 0	220 T	23·54	187
Amptill	Mr. J. Brown	5	1 0	313 T	25·76	170
D Woburn (Hulcote Rectory)	Rev. B. Chernocke Smith	5	1 0	310	23·63	136
Biggleswade (Langford)	F. J. Gurney, Esq. ...	5	1 0	112 T	25·33	166
" (Old Warden)	Mr. G. R. Allis	8	1 2	...	27·27	138
"	C. T. Newbery, Esq. ...	5	28 0	130 T	23·37	...
D Potton (Wrestlingworth)	H. J. King, Esq.	5	1 0	...	24·18	175
Cardington	Miss McLaren	12	3 6	109	24·39	156
"	"	8	0 0	106	25·27	...
D Sandy Rectory	Rev. J. Richardson ...	5	0 7	...	26·21	119
D " (The Lodge)	Rt. Hn. A. W. Peel, M.P.	5	1 0	...	27·66	168
D Potton	Rev. W. Howell Evans	5	0 10	...	25·23	154
Bedford (Western Street)	D. Robie, Esq.	5	0 8	112 T	24·37	158
" (The Grove)	"	5	0 8	115	24·37	...
" (Kimbolton Road)	Col. C. K. Brooke	8	2 0	120 T	24·72	...
" (St. Peter's Street)	Mr. W. Godfrey	5	0 8	114 T	24·42	...
Tempsford Hall	Col. W. Stuart	5	0 9	80 T	25·79	182
Bedford (Milton Ernest)	F. Newbery, Esq.	5	5 0	130 ?	22·88	118
Podington [Wellingborough] ...	R. Orlebar, Esq.	5	1 0	256 T	24·68	156

DIVISION III.—SOUTH MIDLAND COUNTIES—(continued).

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which ·01 or more fell
		Diameter	Height Above Ground	Height Above Sea Level	1889	
CAMBRIDGE.						
			ft.	in.	feet.	inches.
d† Guilden Morden [Royston]	J. G. Johnson, Esq. ...	5	1	2	106 A	23·71 156
Abington Pigotts [„] ..	H. F. Fryer, Esq.	...	0	8	130	23·76 167
Trumpington	F. Parsons, Esq.	6	1	0	...	27·60 167
Granchester Mill	H. F. Fryer, Esq.	5	5	0	31 A	27·36 ...
d Cambridge (Fulbourn Asylum)...	Dr. G. E. Crallan	5	0	10	70 A	29·49 139
d „ (W.W.Cherryhinton)	W. W. Gray, Esq., C.E. ...	5	1	0	35 A	25·27 196
d „ (Beech House)	Miss Nutter	8	4	0	40 A	26·72 179
d „ (Sidney Street)	Mr. W. E. Pain	8	60	0	92 A	24·98 212
d „ (Trinity College) ...	Dr. J. W. Glaisher, FRS. ...	8	0	6	40	26·12 186
Hardwicke	Rev. J. S. Brown	5	0	7	...	28·16 138
d† Cambridge Observatory	Professor Adams, F.R.S. ...	5	1	0	84 A	26·72 179
d „ „	„ „ „	8	1	0	84 A	26·30 179
Quy Hall	Mrs. Francis	5	0	5	...	26·58 164
Papworth Hall	Rev. E. Cheere	5	1	0	127 T	25·17 171
d Ely (Stretham)	Mr. J. Housley	9	4	9	13 A	27·97 161
d „ („ Ferry)	Mr. C. Wright, Junr.	8	5	0	...	24·90 158
„ (Littleport Vicarage).....	Late Rev. Canon Hopkins ...	5	1	0	68 T	23·56 182
Chatteris (Aylesby House)	A. H. Ruston, Esq. ...	8	0	6	45 ?	25·95 157
d „ (The Priory)	H. F. Fryer, Esq.	5	0	5	45	26·01 165
„ (Horseway Lock)	R. Lunn, Esq.	...	...	...	...	21·47 167
March	„ „	...	...	...	...	26·44 ...
Stanground Sluice	„ „	8	1	0	...	22·66 116
* March (Stags Holt)	W. C. Little, Esq.	5	1	0	11 T	24·65 ...
Upwell (Marmont Priory Lock) ..	R. Lunn, Esq.	8	1	0	...	22·62 191
„ (Euximoor House)	H. West, Esq.	5	0	8	15 ?	24·18 165
d Thorney (Wryde House)	S. Egar, Esq.	12	2	0	10 L	23·34 136
Wisbech (Coldham Hall, Elm) ..	Late H. J. Little, Esq. ...	5	1	0	12	25·28 176
d „ (Bank House)	A. Peckover, Esq.	8	0	8	6	25·24 176

DIVISION IV.—EASTERN COUNTIES.

ESSEX.

d Shoeburyness	The Asst. Super. Expts. ...	8	7 3	18	20·20	140
d Southend (Water Works)	C. S. Bilham, Esq. ...	8	1 0	112 L	22·95	176
d Romford (North Ockenden)	Rev. R. T. Crawley ...	5	1 3	100	26·94	143
Ilford (Great Gearies)	Mr. J. Douglas	5	1 0	120	21·50	107
d Upminster Hall ...	G. P. Hope, Esq.	5	1 0	120	27·36	175
d Woodford (The Harts)	Miss C. Spicer	5	3 6	203 T	26·56	171
d „ (Hagger Lane)	W. B. Bryan, Esq., C.E. ...	8	1 0	176 A	22·10	113
d Billericay (Burghstead Lodge) ..	General Branfill	5	1 0	310 A	22·72	166
Brentwood (Sawyer's Hall Farm) ..	Rogers Field, Esq., C.E. ...	5	1 0	270 T	27·50	...
d „ (Dudbrook House) ...	Mr. W. Dellar ...	8	1 3	...	29·63	148
Ingatstone (Coptfold Hall)	The Meteor. Council ...	5	1 0	246	22·91	164
Maldon (Norton Hall)	C. Clarke, Esq.	5	2 6	130 T	23·94	131
d Waltham Abbey (Gunpr. Factory) ..	Col. W. H. Noble	5	1 6	70	23·63	102
Epping (The Hemnalls)	J. Nicholl, Esq.	8	0 8	345	33·46	149
d Bradwell-on-Sea (Bradwell Hall) ..	J. C. Chillingworth, Esq. ...	5	1 1	...	21·31	134

DIVISION IV.—EASTERN COUNTIES—(continued.)

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain. 1889	Days on which .01 or more fell.
		Diameter	Height Above Ground.	Height Above Sea Level		
			ft. in.	feet.	inches.	
ESSEX—(con.)						
Bradwell on-Sea (Down Hall) ...	R. Page, Esq.	5	1 0	20	19·87	103
Chelmsford (Great Baddow).....	H. Corder, Esq.	5	0 6	...	23·68	...
D „ (Writtle).....	E. Rosling, Esq.	5	1 0	140 T	21·42	153
„ (High Street).....	F. Chancellor, Esq. ...	8	1 0	86 T	23·90	152
„ (Roxwell)	R. W. Christy, Esq.	5	1 0	176 T	24·41	138
„ (Broomfield)	W. Impey, Esq.	5	1 4	144 T	23·20	...
D East Mersea Rectory.....	Rev. F. J. Ball	5	1 0	56 T	23·49	184
Harlow (Moor Hall)	Mr. W. Monk	...	...	...	25·62	...
D „ (Sheering).....	Rev. Canon Hill.....	5	1 0	214 T	23·96	173
Witham (Little Braxted Hall).....	J. Taber, Esq.	5	1 0	50	23·64	164
„ (Rivenhall)	Rev. F. B. H. Bridges	5	1 0	138 T	25·85	...
D Dunmow (High Roding)	Rev. E. Maxwell	5	1 0	252 T	22·21	181
D Birchanger [Bishops Stortford]..	Rev. F. Rowden.....	8	0 11	329 T	23·89	191
D Colchester	H. Goodyear, Esq., C.E.	8	3 0	68 T	23·31	159
„ (Surrey Villa).....	J. C. Hopwood, Esq.	5	1 0	110 T	24·25	145
Braintree (Bocking Place).....	S. Courtauld, Esq. . . .	8	2 1	212 T	24·94	144
Dunmow (Saling Grove)	J. N. Harrison, Esq.	8	1 0	290	22·38	...
Earls Colne (Chalkney House).....	H. F. Hills, Esq.	5	1 0	180 T	27·16	127
D Dedham (The Rookery)	W. H. Penrose, Esq.	8	1 0	45	24·96	176
Langham Rectory	Rev. T. S. Raffles	5	1 0	134	24·22	179
D Saffron Walden (Newport)	Rev. G. F. Tamplin ...	5	4 0	220 T	26·69	180
D „ „	J. G. Bellingham, Esq.	5	1 0	179 T	26·35	202
SUFFOLK.						
Stutton (Alton Hall).....	J. South, Esq.	5	1 2	...	24·91	121
Sudbury (Assington).....	P. Gurdon, Esq.	5	4 0	...	27·16	155
D Ipswich (Orwell Park)	Mr. J. Wallis	8	1 0	60 T	26·22	161
D „ (Belstead Hall)	A. Harwood, Esq.	8	9 0	120 T	24·58	129
D Sudbury (Friars Street)	E. Ransom, Esq.	5	1 7	93 T	23·97	175
D „	J. Alexander, Esq.	5	1 2	130 T	24·01	168
Ipswich (Bishop's Hill).....	G. A. Biddell, Esq., C.E.	5	1 0	104 T	27·21	...
„ (Playford).....	M. Biddell, Esq.	5	2 6	120 T	27·06	...
Lavenham Hall	W. Biddell, Esq., M.P.	5	1 11	220 ?	25·21	118
D Woodbridge (Bank House)	S. Alexander, Esq.	5	1 0	...	26·85	154
D „ (The Cedars, Melton) ...	W. P. T. Phillips, Esq.	5	...	...	27·78	175
D Swilland Vicarage	Rev. J. Wickham	5	1 0	...	26·23	161
D Rendlesham Hall	RtHonLrd.Rendlesham	5	1 9	88 T	28·15	154
D Haverhill (Great Thurlow)	A. Boa, Esq.	5	1 0	241 T	25·26	176
Clare (Stansfield)	J. Slater, Esq.	5	0 11	...	28·47	...
D „ (Hawkedon Rectory)	Rev. B. P. Oakes	5	4 8	305 T	26·69	183
Ash Bocking Vicarage	Rev. M. B. Cowell.....	5	7 3	231 T	23·47	132
D Aldborough (Aldringham Ho.)..	F. Garrett, Esq.	8	4 5	50 B	28·43	192
D Stowmarket (Wetherden Rec.)...	Rev. C. J. Goodhart ...	8	0 6	185 T	27·59	162
D BurySt.Edmunds(DrinkstonePk)	Mr. G. Palmer	8	1 2	220 T	27·11	170
D Framlingham (Mount Pleasant).	Mr. R. Whitehead.....	5	1 2	...	27·82	146
D BurySt.Edmunds(AbbeygateSt.)	Mr. F. Summers	...	...	...	23·80	166
† „ „ (Westley)	R. Burrell, Esq.	5	1 0	226 T	29·70	...
D „ „ (Hengrave)	Mr. W. Nichol	5	1 2	91	27·70	113

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain. 1889	Days on which .01 or more fell.
		Diameter	Height Above Ground	Height Above Sea Level		
			ft. in.	feet.	inches.	
SUFFOLK—(con.)						
d Ixworth (Walsham-le-Willows).	Miss M. C. Martineau..	5	1 0	...	29·56	181
Stradbroke Vicarage	Rev. Dr. Tate.....	5	2 2	...	24·85	...
†Ixworth (Barningham)	W. Lingwood, Esq. ...	8	1 0	136 T	23·65	...
d Beccles (Sotterley Hall)	Col. St. J. Barne	5	0 11	...	31·01	200
"	Clifford Smith, Esq. ...	5	5 0	...	25·74	...
Lowestoft (Gisleham)	Rev. H. Jodrell	5	1 0	36 T	24·56	...
† " (Carlton Colville)	G. Edwards, Esq., C.E.	8	0 9	6 T	26·09	...
d " (Bryn-y-Môr)	S. H. Miller, Esq.	5	1 0	86	24·46	169
" (") M	"	8	1 0	86	24·04	...
d " (The Clyffe, Corton)...	J.J. Colman, Esq., M.P.	5	4 0	65 L	25·41	196
" (Somerleyton Rect.)...	The Royal Meteor. Soc.	8	1 0	50	26·50	181
Yarmouth (Belton)	Miss A. Howes ..	5	0 8	15 T	23·48	164
NORFOLK.						
d Diss	T. E. Amyot, Esq.	5	1 0	96	26·23	186
d Harleston (Rushall Vicarage) ...	Rev. C. Gape	5	1 1	117 T	25·67	176
North Lopham	Mrs. Pitt.....	8	1 2	...	24·31	...
d Brandon (Santon)	Rev. Canon Du Port ...	...	...	...	22·54	175
d†Geldeston [Beccles]	E. T. Dowson, Esq. ...	5	1 0	38 T	24·11	182
" "] M	R. " " "	8	1 0	38 T	24·26	...
d " "]	R. Dashwood, Esq. ...	5	1 0	45 T	25·68	169
Ellingham ["]	H. Youngman, Esq. ...	5	3 0	...	22·93	...
d Loddon (Bergh Apton)	Rev. T. F. Lloyd	8	2 4	...	24·77	155
Watton	Rev. Canon Du Port ...	...	...	...	25·20	...
d Hingham	" " "	...	...	...	26·48	165
d Downham Market (W. Dereham)	Mr. C. Blanchfield.....	5	0 11	20	24·44	204
d Denver	Rev. Canon Du Port ...	8	1 2	80 T	24·20	177
d Stoke Ferry (Wereham)	" " "	5	6 0	66	22·53	157
Wymondham (Hetherset)	" " "	...	...	...	26·81	...
d Downham (Crimpleham)	W. S. Horn, Esq.	5	1 0	110 T	23·34	180
" (Wimbotsham)	F. Durrant, Esq.	...	...	...	23·53	...
Swaffham (Pickenham Hall) ..	E. A. Applewhaite Esq.	5	1 0	104 T	28·12	184
Outwell Sluice	R. Lunn, Esq.	9	...	16	22·29	125
Yarmouth (Sailors' Home)	The Meteor. Council ...	8	4 0	12	26·87	207
d " (Market Place).....	W. C. Steward, Esq....	5	0 9	...	27·77	156
" (Halvergate Hall) ...	Rev. Canon Du Port ...	5	3 3	48 T	26·77	...
d Norwich (Postwick)	" " "	...	...	...	26·89	190
d " (Carrow House)	J. J. Colman, Esq., M.P.	5	4 0	30	25·70	105
† " (Thorpe High House) ...	W. Birkbeck, Esq. ...	5	1 0	137 T	26·36	185
d " (Essex Street)	F. Dix, Esq.	9	2 6	85 T	24·61	168
" (Newmarket Road)	Rev. Canon Du Port... ..	...	...	...	25·23	...
" (Heigham)	J. H. Everitt, Esq. ...	5	3 2	37 T	25·10	210
d Blofield	A. W. Preston, Esq....	5	1 0	50	29·82	208
†Acle	Rev. R. W. Kennion ..	8	0 9	40	25·54	118
*Swaffham (Grammar School) ...	C. J. Drury, Esq.	5	1 10	242 T	25·32	183
d "	W. H. Plowright, Esq.	5	5 0	250 T	23·94	175
d Costessey	A. J. Culley, Esq.	5	1 0	...	24·36	150
d Sprowston (Oak Lodge).....	T. Cozens Hardy, Esq.	5	1 0	101 T	26·09	185

DIVISION IV.—EASTERN COUNTIES—(continued.)

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which "01 or more fell.
		Diameter	Height Above Ground	Height Above Sea Level	1889	
NORFOLK—(con.)						
East Dereham.....	G. H. Cooper, Esq.	8	3 0	161	24·39	139
" " 	Rev. Canon Du Port ...	...	...	...	23·79	...
Drayton	" " " 	5	1 2	...	25·34	...
Swaffham (Dunham).....	" " " 	5	1 1	320	26·17	...
d Acle (Oby)	" " " 	5	1 5	45?	25·26	193
Salhouse	" " " 	...	...	...	27·56	...
Wiggenhall (Outlet Syphons) ..	R. Lunn, Esq.	8	...	...	24·27	150
d TilneySt.Lawrence(Aylmer Hall)	W. B. Parsons, Esq.	8	1 2	...	25·11	160
d Terrington	J. T. Seccombe, Esq. M.D	5	1 0	15	26·37	163
d Felthorpe	Mrs. Bouchier	5	1 1	75	27·79	129
d Bylaugh Park Gardens	Mr. A. Fenn	5	1 0	130	28·41	206
Reepham (Whitwell)	Rev. W. H. Freeman...	8	1 2	120	24·10	...
Cawston	Rev. T. H. Marsh	5	1 0	135	27·28	211
d Aylsham (Woodgate)	B. J. W. Purdy, Esq. ..	5	1 0	100	27·87	175
d North Walsham (Dilham)	Rev. Canon Du Port ...	...	...	...	25·89	222
d " " (Worstead) ..	R. Cross, Esq.	8	1 3	...	26·81	150
Hillington (Rectory)	Rev. H. Ffolkes.....	8	1 0	89	27·89	196
d† " School	" " " 	5	3 6	94	27·81	196
d Fakenham (Pensthorpe)	Rev. Canon Du Port ...	...	...	...	25·08	148
d " (Croxton)	" " " 	...	...	...	24·01	162
Dersingham	Rev. E. W. Penny.....	5	1 0	85	26·07	...
Fakenham (Cranmer Hall)	Sir L. Jones, Bart.....	...	...	160	24·58	...
Holt (Letheringsett Hall).....	W. Cozens Hardy, Esq. .	8	1 0	...	25·86	131
Holkham.....	J. Davidson, Esq.	12	4 0	39	23·56	103
Hunstanton Hall	Mr. Nisbet	11	3 8	60	24·36	...

DIVISION V.—SOUTH WESTERN COUNTIES.

WILTS.

d Landford	J. R. Wigram, Esq.	5	1 10	167	26·19	177
d Donhead St. Mary (Charlton Ho.)	Col. G. Best	5	0 9	514	32·36	192
d Broad Chalke	C. E. B. Hewitt, Esq. ...	8	0 8	315	25·07	164
d† Salisbury (Alderbury)	Rev. R. S. Hutchings ...	5	0 8	263	23·46	167
d† " (West Dean)	Rev. W. L. W. Eyre ...	5	1 0	137	23·76	164
d " (Britford)	C. E. B. Hewitt, Esq. ...	5	1 0	...	24·39	171
d "	W. Hussey, Esq.	5	1 5	150	26·43	167
Tisbury	C. Combes, Esq.	5	1 3	400	20·39	...
d Salisbury (Wilton House).....	C. E. B. Hewitt, Esq. ...	8	0 5	180	26·33	194
d Mere	" " "	5	1 0	...	34·65	174
d " Down	T. H. Baker, Esq.	5	1 0	702	32·75	215
d Winterslow	C. E. B. Hewitt, Esq. ...	5	1 0	470	26·46	157
d Maiden Bradley	" " "	...	...	...	37·82	175
d Warminster (Rye Hill).....	" " "	8	2 0	450	32·58	198
d Amesbury	" " "	5	1 0	...	22·83	170
Salisbury Plain (Chitterne House)	R. Hayward, Esq.	11	4 0	319	22·74	154
Warminster (Bugley Reformat'y)	Mr. W. F. Harold	5	5 0	570	29·33	...
d "	E. Cruse, Esq.	5	1 0	387	27·18	184
d " (Downside)	C. E. B. Hewitt, Esq. ...	8	4 0	393	29·91	...

DIVISION V.—SOUTH WESTERN COUNTIES—(continued.)

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain. 1889	Days on which ·01 or more fell.
		Diameter	Height Above Ground	Height Above Sea Level		
			ft. in.	feet.	inches.	
WILTS—(con.)						
D Amesbury (Figheldean)	G. Knowles, Esq.	5	1 0	260 T	24·80	159
Ludgershall	Rev. W. H. Awdry ...	8	0 8	422 A	27·54	157
D „ (Everleigh)	C. E. B. Hewitt, Esq..	5	1 2	590	31·02	174
D „ (Chute)	„ „ „	...	...	...	28·05	172
D „ (Conholt Park)	Lady C. Wellesley.....	5	1 0	750 T	30·30	185
D „ (Collingbourne Kingston).	Baldwin Latham Esq CE	5	1 0	470 A	29·33	190
D Market Lavington	C. E. B. Hewitt, Esq...	5	1 0	...	24·04	146
D Trowbridge (Steeple Ashton Vic.)	„ „ „	5	1 0	240 T	24·70	194
D „ (Wingfield).....	T. H. Clark, Esq.	5	1 0	190 T	25·34	167
D „ (Rodney House) ...	W. J. Mann, Esq.....	5	1 1	140	23·63	176
D „ (Lovemead)	Dr. G. Kayler.....	5	1 3	125 B	23·98	146
D Bradford (Westbury Ho.).....	Miss Spencer	5	1 2	100 T	26·46	157
D „	C. E. B. Hewitt, Esq...	5	1 0	...	27·11	166
D „ (Murhill, Winsley) ...	Col. Magrath	8	1 0	270	23·81	156
D „ (Holt)	C. E. B. Hewitt, Esq...	...	...	...	25·96	204
D Devizes (Southgate House)	B. H. Cunningham, Esq.	8	1 0	436 T	27·97	174
D „ (Wilts Co. Asylum) ...	Dr. Ireland Bowes.....	8	2 4	500 T	24·40	167
D Buttermere	C. E. B. Hewitt, Esq...	5	4 9	...	31·37	205
D Burbage (Wolfhall)	„ „ „	8	1 0	546	24·64	132
D Shalbourne	„ „ „	5	1 0	...	25·62	165
D Bishop's Cannings	Rev. C. W. Hony	5	1 0	446 A	26·09	174
D Great Bedwyn	C. E. B. Hewitt, Esq...	...	...	...	22·97	148
D Devizes (Shepherd's Shore)	„ „ „	5	1 6	555	25·35	167
D Chippenham (Lacock)	Miss Awdry	5	0 11	250	25·57	181
D Marlborough	C. E. B. Hewitt, Esq...	...	...	...	26·86	198
D „ (Mildenhall)	Rev. C. B. Soames	5	1 0	456	24·72	160
D Corsham	C. E. B. Hewitt, Esq...	5	1 0	350 P	25·04	179
D Calne (High Street)	Mr. H. Wilkins	5	3 6	244	24·95	190
D „ (Compton Bassett)	Mr. W. A. Cook	8	1 0	395 T	27·51	168
D Ramsbury	C. E. B. Hewitt, Esq...	5	1 0	411	23·83	177
D Ogbourne Maizy.....	„ „ „	5	1 0	...	26·04	156
D Broad Hinton	Rev. J. A. Lloyd	5	3 0	633 T	25·02	170
D Wootton Bassett	C. E. B. Hewitt, Esq...	5	1 0	...	24·51	...
D† Swindon, New.....	F. G. O'Connor, Esq. ...	8	0 11	378	21·98	179
D „ (Pen Hill)	H. Arkell, Esq.	5	0 10	400	21·67	...
D Malmesbury (The Priory).....	A. W. Chubb, Esq. ...	6	3 0	...	27·39	114
D „ (Charlton Cott.) ...	C. E. B. Hewitt, Esq...	...	1 0	...	26·75	162
D Highworth (Hannington) ..	„ „ „	...	...	...	22·97	140
DORSET.						
D Weymouth (Wyke Regis)	Mrs. Pretor.....	5	0 9	80 B	25·33	156
D Swanage (The Bank).....	J. Andrews, Esq.	5	1 0	8	22·89	151
D „	Rev. H. Pix	5	2 0	60	24·22	153
D Weymouth	T. B. Groves, Esq.....	5	1 0	80	23·97	138
D „ (Langton Herring)...	Rev. C. H. Gosset.....	8	1 0	158 A	24·35	157
D† „ (Osmington Lodge)...	Col. Hall.....	5	1 0	242 A	27·16	164
D Corfe Castle (Creech Grange) ...	N. Bond, Esq.	5	1 0	180	30·28	114
D Abbotsbury.....	Mr. A. Dight	5	...	150	28·61	...

DIVISION V.—SOUTH WESTERN COUNTIES—(continued).

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which ·01 or more fell.
		Diameter	Height Above Ground	Height Above Sea Level	1889	
			ft. in.	feet.	inches.	
DORSET—(con.)						
D Wareham (Castle Gardens)	S. W. Bennett, Esq. ...	5	2 6	18	25·65	154
„ (Binnegar Hall)	O. C. Farrer, Esq.	5	0 6	60 ?	29·01	...
Little Bredy	Rev. R. R. Meadows ...	5	1 0	353 T	32·08	142
Poole (The Yarrells)	F. Styring, Esq.	5	1 1	60	23·97	143
D „ (Parkstone)	R. H. Barnes, Esq. ...	5	1 0	198 T	24·55	172
D Poole Road [Bournemouth]	Miss Kemp-Welch	5	0 11	137	25·28	157
D Lyme Regis	M. C. Preston, Esq. ...	5	1 1	...	26·75	171
Bere Regis (Bloxworth Rectory)	Rev O.P. Cambridge FRS	8	1 6	...	26·02	126
D „ „ (House)	Col. Cambridge	5	2 0	100	25·16	111
D Maiden Newton (Cattistock Lodge)	Mr. Chapple	8	1 0	400 B	38·12	162
D Beaminster Vicarage	Rev. Canon Codd	5	1 0	...	30·98	179
D Blandford (Whatcombe)	J. Mansel-Pleydell, Esq.	5	0 10	259 T	30·78	138
„ (Tarrant Keynston)	G. Galpin, Esq.	5	1 0	100 T	26·67	...
Cerne Abbas (Melbury)	Mr. T. C. Elliott	12	2 9	...	28·44	148
D Beaminster (Chedington)	Miss Creed	5	1 6	604 T	33·49	186
D*Wimborne Minster (Chalbury)	Rev. G. H. Billington..	5	2 0	338 T	25·89	155
Hazelbury Bryan Rectory	Rev. Canon Wheeler ...	5	1 0	305 T	38·60	162
D Shaftesbury	T. Ackland, Esq.	5	1 4	722 T	30·92	179
D Gillingham	S. H. Stephens, Esq.	5	1 2	244 T	28·47	182
DEVON.						
Salcombe (Prawle Point)	The Meteor. Council ...	8	1 9	350	26·94	185
D „ (The Molt)	Mr. Langmead	8	1 3	61 L	32·49	158
Kingsbridge	W. H. Webb, Esq. ...	5	1 0	84	36·30	180
D Revelstoke (Membland)	Mr. G. Baker	5	1 0	280 T	34·82	144
D Dittisham (Chipton)	Mr. H. Bond	5	1 6	360 T	37·19	144
D Plymouth (Hobart Terrace)	J. Merrifield, Esq. LL.D.	8	9 2	130 T	34·41	184
D*Devonport (Rowdens Res.)	H. Francis, Esq., C.E.	5	1 0	201 T	31·79	191
D Ivybridge (Langham Hill)	Miss Glanville	5	1 0	400 T	40·52	180
Brixham (Lupton)	Mr. J. Gibson	5	1 6	220 T	28·11	132
Plympton (Fursdon)	F. R. Fox, Esq.	5	1 6	430	46·13	...
Bere Ferrers	Rev. F. T. W. Wintle.	5	1 0	100	39·11	180
Torquay (The Rosery)	A. Chandler, Esq.	5	1 0	36	28·28	177
D „ (Grey Lodge)	Col. J. R. Currie	5	1 0	161	26·40	177
D† „ (Babbacombe) <i>Snowdon</i>	E. E. Glyde, Esq.	5	1 0	294 T	26·40	183
D „ (Watcombe Park)	Col. C. Ichabod Wright	5	1 0	500 T	25·32	174
Buckfastleigh (Bossel Park) ...	J. Hamlyn, Esq.	5	1 0	250	43·65	159
D*Walkhampton (Lowery)	H. Francis, Esq., C.E.	5	1 0	890 T	49·26	173
Abbotskerswell (Court Grange) ..	Mrs. Hare	5	1 0	130 B	25·95	147
D Ashburton (Holne Vicarage) ...	Rev. J. Gill	5	1 0	650 B	48·10	204
D† „ (Druid House)	Fabyan Amery, Esq. ...	5	1 0	572 T	36·61	183
D Kingsteignton (Teignbridge Ho.)	F. H. Plumptre, Esq. ...	5	1 0	27 T	25·38	156
†Teignmouth (Lower Reservoir) ...	W. C. Lake, Esq. M.D.	5	1 0	138 L	32·31	...
„ (Marine Villa)	W. B. Harris, Esq. ...	5	1 0	18	24·91	167
D „ (Woodway)	G. W. Ormerod, Esq.	5	1 0	235	26·65	182
D†Tavistock (Public Library)	Mr. R. Westington ...	8	20 0	283 T	38·63	191
D „ (West Street)	H. A. Gibson, Esq.	5	1 1	272	44·37	213
D†Ilington (Middlecott House) ...	Alfred Lyon, Esq.	9	3 6	649 T	35·47	128

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which -01 or more fell.
		Diameter	Height Above Ground	Height Above Sea Level	1889	
			ft. in.	feet.	inches.	
DEVON—(con.)						
Princetown	The Royal Meteor. Soc.	5	1 0	1395	81.55	213
„ (Cowsic Valley).....	H. Francis, Esq., C.E.	8	1 6	1352 A	65.65	...
Ashburton (Cator Court)	F. H. Firth, Esq.	5	1 0	1071 T	46.84	198
„ (Widcombe Vic.) ...	Rev. J. Williams	5	2 0	810	40.08	...
D Chudleigh (Ideford) ...	Rev. G. J. Ford.....	4	1 0	300 A	27.13	175
D Bovey Tracey (Colehays)	Mr. E. Underdown ...	5	1 3	415 T	33.59	193
D Dawlish	Capt. Strangways, R.N.	5	1 3	120 B	27.17	176
+Milton Abbot (Endsleigh).....	Mr. F. Yole	5	1 0	180 ?	51.41	...
D Chudleigh (Torquay Waterworks)	T. S. Weeks, Esq., C.E.	8	4 0	718 A	31.51	190
„ (Trusham)	Rev. O. H. Cary	5	1 0	322 T	31.27	202
Budleigh Salterton	R. Walker Esq., M.D..	5	4 0	80	24.03	160
„ „ (Ravenshaw)	Col. Carlile	6	0 6	50	24.44	164
„ „ (E. Budleigh)	R. H. Lipscomb, Esq..	5	1 0	70 A	25.76	148
„ „ (Bickton) ...	„ „ „ „	5	1 0	90	25.48	170
Coryton (Lew Down)	Mr. T. M. Symons	5	4 0	445	38.93	170
D Polapit Tamar [Launceston] ...	E. Coode, Esq.	5	2 9	300	35.03	229
D Christow (Torquay W. W.)	T. S. Weeks, Esq., C.E.	8	1 0	842 A	32.26	196
D Chagford (Batworthy)	F. N. Budd, Esq.	8	1 0	1250 ?	54.00	207
+Sidmouth (Sidmount)	The Royal Meteor. Soc.	5	1 0	149 A	26.55	201
D Rousdon [Lyme Regis].....	C. E. Peek, Esq.	5	1 0	524 T	28.17	180
„ „ „ „	„ „ „ „	3	1 0	524 T	28.35	...
D+Cleveland [Lyme Regis]	E. L. Ames, Esq.	5	1 11	465 A	30.07	177
Exeter (St. Leonard Road)	Miss M. E. Clark	5	1 0	110	26.39	...
D+ „ (Devon & Exet. Inst.) ...	Mr. E. Parfitt.....	6	13 7	155 A	23.48	137
D „ (Manston Terrace)	Miss Dymond	5	1 0	166 A	23.22	183
D+Okehampton (Oaklands)	W. H. Holley, Esq. ...	5	1 0	521 T	40.73	174
Axminster (Great Trill)	F. J. Sparks, Esq.....	5	1 0	300 T	25.27	105
D+Exeter (Brampford Speke)	Miss Gamlen	5	1 0	113 T	25.94	185
D Axminster (Furzebrook)	Capt. Rogers	5	1 5	128 T	24.39	162
D „	Mr. S. Griffin	5	4 6	138 T	27.22	134
D Honiton (Feniton Court)	Miss A. Pinckney	5	1 0	229	29.28	185
D „ (Ivedon)	E. Stanley, Esq.	3	1 0	430 T	28.17	150
D Hatherleigh (Broomford Manor)	Mr. W. Mortimore.....	5	1 4	484 A	35.83	179
„ (Winsford)	Mr. A. Muirhead	5	1 3	500	29.06	...
„ (Ash).....	J. S. Osbourne, Esq....	5	1 1	332 A	33.10	113
D Cullompton	T. Turner, Esq.	5	1 0	202 A	30.32	195
D Petrockstow (Heanton Satchville)	Mr. A. Eames	5	1 0	332 T	32.60	182
Tiverton (Cove)	The late W. N. Row, Esq.	11	0 10	450 ?	31.21	...
D „ (Broomhill).....	Mrs. Dickinson	5	1 0	380	31.14	177
„ (Ivy Place, S. Peter's St)	H. S. Gill, Esq.....	5	6 0	270	30.58	200
D Torrington (Beare Ho., Langtree)	Mr. J. Snow	5	1 0	451 A	39.02	189
„ (Stevenstone)	R. H. Lipscomb, Esq..	5	1 0	450	34.29	175
„ (Little Silver).....	„ „ „	5	1 0	395 T	33.89	183
D Bampton (Huntsham)	Col. Troyte	8	1 0	640	37.44	205
D South Molton (Rose Ash)	Mrs. Davy	8	1 0	766 A	35.90	154
D Bideford (Heale House Littleham)	R. Sanders, Esq.	8	1 0	280 B	36.00	172
D Hartland Abbey.....	Mr. G. Sleep	5	1 6	222 T	35.66	170
D South Molton (East Street)	N. C. Hatherly, Esq. M.D.	5	1 0	430 B	38.20	194

DIVISION V.—SOUTH WESTERN COUNTIES—(continued.)

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain. 1889	Days on which 101 or more fell.
		Diameter.	Height Above Ground	Height Above Sea Level		
			ft. in.	feet.	inches.	
DEVON—(con.)						
South Molton (Castle Hill)	Mr. R. Nicholas	12	3 9	320 T	39·30	191
D Bideford (Water Works).....	Baldwin Latham Esq CE	5	1 0	335 T	31·88	157
*† „ (Horwood)	Rev. J. Dene	5	1 0	288 T	31·30	198
D*† „ (Northam)	Rev. M. D. Churchward	5	1 0	173 T	29·63	187
D West Buckland Rectory	Rev. J. H. Thompson..	5	1 0	...	40·60	208
D Barnstaple	Mr. Knill	8	1 0	31 T	30·86	161
D „ (Pilton)	Miss Hibbert	5	1 0	40 B	34·84	190
D „ (Arlington Court) ...	Lady Chichester.....	8	1 1	613 B	47·10	206
Lynton (Parracombe)	Rev. J. F. Chanter ...	5	3 0	795 T	42·64	167
D† Ilfracombe Hotel	Mr. W. Tattam	12	9 0	34	28·07	171
† Lynton (Lee Abbey)	C. F. Bailey, Esq.	5	0 6	340 T	31·01	...
D† Lynmouth (Glenthorne)	W. H. Halliday, Esq...	5	0 9	93	34·65	179
CORNWALL.						
Penzance (Penlee)	J. Branwell, Esq.	5	1 0	71 T	41·37	211
„ (Trevean)	Major Ross	5	1 6	90 B	40·60	189
D „ (St. Clare)	Rev. Preben. Hedgeland	5	1 0	213 T	41·19	239
Marazion	T. W. Field, Esq.	5	2 0	30 ?	36·90	196
Falmouth (New Observatory) ..	The Meteor. Council ..	11	2 0	169 T	41·42	199
D „ („ „)	E. Kitto, Esq.	8	1 9	169 T	40·78	199
St. Just	R. B. Searle, Esq.	5	1 0	400	40·27	...
Morvah (Bosporthenis) ..	Mr. J. H. Thomas	5	3 6	600 ?	38·55	...
D Falmouth (Carclew)	Mr. J. Simmons	5	0 9	...	39·35	154
D Redruth (Trevince)	E. B. Beauchamp, Esq.	8	0 8	240 T	40·62	205
D „ (Trewirgie).....	A. H. Jenkin, Esq. ...	5	1 0	400 T	39·70	215
D „ (Tehidy Park)	Mr. A. Mitchell.....	8	1 1	287	34·22	195
D† Truro (Royal Institution).....	Mr. Crowther	5	40 0	56 T	37·40	212
„ (Penarth)	N. Whitley, Esq.	10	1 0	200 T	35·11	192
D „ (Porthgwithden) ...	Rev. Canon Phillpotts.	5	1 0	50	37·95	201
D Probus (Lamellyn).....	H. Tresawna, Esq.....	5	0 6	...	40·66	168
St. Agnes	Mr. Opie	5	1 3	278 B	37·36	168
D†* St Austell (Trevarna).....	W. Coode, Esq.	5	0 6	300 T	43·22	224
„ (Gunheath).....	J. W. Higman, Esq....	...	...	800	44·20	...
Par Station (Penellick)	W. E. Geach, Esq. ...	5	0 9	240 T	32·45	...
Empacombe [Devonport]	S. Harvey, Esq.	5	0 7	20	33·31	185
D St. John's [Devonport]	Rev. J. H. Kirwan.....	5	1 0	20	34·49	184
D St. Germans (Catchfrench)	Miss Tatham	5	0 5	250	46·55	221
D Lostwithiel (Lanwithan)	Miss Foster.....	10	1 0	80	38·06	189
D† Liskeard (Dean Terrace)	S. W. Jenkin, Esq., C.E.	5	1 1	375 T	45·20	203
† Saltash (Pentillie Castle)	Mr. A. W. Cove.....	5	1 6	150 B	46·70	198
D† Bodmin (Lanhydrock)	Rev. Prebendary Every	5	1 0	390	46·15	233
D† „ (Fore Street).....	Mr. A. Hambly	8	2 6	336 T	44·84	218
Liskeard (St. Cleer)	S. W. Jenkin, Esq., C.E.	5	1 1	620 T	42·17	...
† Callington (Hingston Down).....	Mr. Wadge.....	5	3 0	850 T	40·06	180
D† Launceston (Altarnun)	Rev. A. H. Malan.....	5	1 0	570 B	53·96	233
D „ (South Petherwin)...	Rev. H. May	5	0 4	470 B	36·61	202
D Bude	J. Arthur, Esq.	5	1 0	16 B	27·81	130
Stratton (Trelana, Poughill) ..	Col. Field	5	1 0	200	31·87	...

DIVISION V.—SOUTH WESTERN COUNTIES—(continued.)

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which ·01 or more fell.
		Diameter	Height Above Ground	Height Above Sea Level	1889	
SOMERSET—(con.)						
D Batheaston Reservoir.....	C. Gilby, Esq., C.E. ...	6	2 0	248 A	24·72	189
Yatton (Chelvey)	Bristol Water Works...	7	10 0	...	27·91	148
Barrow Gurney Reservoir.....	J. Trotter, "Esq." ...	5	1 0	320 T	30·36	179
D Clevedon (Channel View).....	J. Trotter, Esq.....	5	1 0	166 T	27·42	165
Long Ashton Estate Office	T. Dyke, Esq.....	8	1 0	134	28·47	...

DIVISION VI.—WEST MIDLAND COUNTIES.

GLOUCESTER.

D Monkswood Reservoir [Bath] ...	C. Gilby, Esq., C.E. ...	6	2 0	363	27.80	198
Bristol (Small Street)	Bristol Water Works...	12	33 10	52	26.58	144
D† Clifton (South Parade)	Dr. G. F. Burder	8	1 0	192 A	30.49	168
D „ (Royal York Crescent)	Miss Bridge	5	8 2	226 T	30.94	193
D „ (Clifton College)	D. Rintoul, Esq.	8	1 2	230	29.60	146
D „ (Pembroke Road)	R. F. Sturge, Esq. ...	8	0 10	215	31.13	173
D Bristol (Redland)	Mr. M. W. Dunscombe	5	6 6	225	29.53	138
D „ (Over Court) Park	R. C. C. Lippincott, Esq..	5	0 5	148 T	29.70	175
D „ („ „) Garden ...	„ „ „ „	8	0 8	137	29.43	174
Chipping Sodbury (Frampton Cotl)	J. Marsh, Esq.	5	1 0	180 A	26.34	132
D „ „ (Stanshawes Ct)	R. N. Hooper, Esq. ...	5	1 3	280 A	28.81	150
D Wickwar Rectory	Rev. R. J. Lyon ...	5	1 0	260 A	28.49	171
Dennel Hill [Chepstow]	Major Cowburn	8	1 0	573 A	33.57	170
Wirewoods Green [Chepstow] ...	Godfrey Seys, Esq. ...	8	0 10	220	32.07	160
D Fairford (Kempsford)	R. A. Iles, Esq.	5	0 8	...	22.74	146
Berkeley (Salter Street)	H. E. Cooke, Esq.	5	6 0	60	27.58	180
D „ (Sharpness New Docks)	F. A. Jones, Esq., C.E.	8	3 9	50	27.38	152
D Lechlade	T. Arkell, Esq.	5	0 10	253	22.96	151
D Amberley (Highlands)	Mrs. Blackwell	8	0 10	550 T	25.48	132
D Lydney (Clanna)	Capt. Brinsley Marling	5	1 0	260	35.20	176
D Cirencester (Claremont Place) ...	R. Gorton, Esq.	8	1 0	356 T	25.62	175
„ { „ „ } ...	„ „ „ „	8	2 0	357 T	25.91	175
„ { „ „ } ...	„ „ „ „	8	0 6	356 T	26.19	175
„ { „ „ } ...	„ „ „ „	8	11 0	366 T	22.01	175
D „ (Royal Agricultural Coll.)	A. G. Bloxam, Esq. ...	5	1 0	443 A	26.50	167
D „ (Further Barton)	Miss Brown	5	1 0	425	26.76	170
D Stroud (Stanley Park)	W. J. Paley Marling, Esq	8	1 0	365	29.10	171
D „ (Upfield)	Miss Stanton	5	1 0	226 A	28.47	180
D Fairford (Hatherop Rectory) ...	Rev. R. P. Davies	8	1 3	411 A	25.51	142
D Frampton-on-Severn (Saul Lodge)	F. A. Jones, Esq., C.E.	5	3 6	42 A	24.78	176
Coleford (Newland)	L. H. Hall, Esq.	5	2 0	350 ?	30.05	144
„ (The Coombs)	R. Tyrer, Esq.	5	...	660	38.61	194
Newnham-on-Severn	D. J. Wintle, Esq.	5	0 10	56 A	34.29	...
D Coleford (Staunton Rectory) ...	Mrs. Jay Jones	5	0 8	726 T	33.03	197
D Great Barrington [Burford]	B. W. Mason, Esq.	8	1 0	416 T	25.98	138
Northleach (Yanworth)	T. Arkell, Esq.	5	1 0	...	27.01	...
„ (Sherborne Park) ...	Mr. Scott	5	1 0	405	26.88	...
D* „ (Hampnett Rectory).	Rev. W. Wiggin	5	1 0	653 A	26.12	187

K 2

DIVISION VI.—WEST MIDLAND COUNTIES—(continued.)

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain. 1889	Days on which "01 or more fell.
		Diameter.	Height Above Ground.	Height Above Sea Level		
			ft. in.	feet.	inches.	
STAFFORD—(con.)						
D Brewwood (Belvide Res.)	G. R. Jebb, Esq., C.E.	8	1 0	367 ∇	25.39	122
D Penkridge (Rodbaston)	H. Ward, Esq.	5	1 0	324	27.40	149
Hednesford... ..	W. Vawdrey, Esq., C.E.	5	1 0	770	25.78	119
Alrewas (The Cottage)	E. Sellick, Esq.	5	1 6	181 ∇	27.49	136
D Burton (Rangemoor)	Mr. Bennett	8	5 6	424 ∇	31.05	168
D „ (Shobnall)	R. W. Abbotts, Esq.	5	6 0	156 ∇	26.28	146
D „ (Derby Road)	J. G. Wells, Esq.	5	1 0	151 ∇	28.42	213
D „ (Hoar Cross)	F. W. Lycett, Esq. ...	8	4 0	400 ∇	29.82	175
D Uttoxeter (Brook House)	Mr. J. J. Gibbons	5	1 0	...	30.70	202
D Market Drayton (Old Springs)...	F. E. Harding, Esq.	5	0 9	422	27.27	161
D† Cheadle (The Heath House)	J. C. Philips, Esq.	5	1 0	647 ∇	30.81	205
D† „ (Tean Vicarage)	Rev. G. T. Ryves	5	1 0	470 ∇	32.19	198
D Longton (The Meir)	J. B. Piercy, Esq.	5	1 0	618 ∇	31.03	214
D Newcastle (Madeley)	„ „ „	5	1 0	348 ∇	33.24	191
Stoke (Stanley Reservoir)	E. B. Smith, Esq., C.E.	5	3 1	550 ∇	31.15	120
Etruria	„ „ „	5	4 2	440	32.06	123
Alstonfield Vicarage	Rev. W. H. Purchas...	5	1 0	909 ∇	33.54	179
D Leek (Wall Grange)	J. B. Piercy, Esq.	8	1 0	458 ∇	37.35	204
D „ „ „	„ „ „	5	1 0	458 ∇	35.02	204
Knypersley [Congleton]	E. B. Smith, Esq., C.E.	5	14 0	500 ∇	37.92	179
Leek (Rudyard)	„ „ „	5	12 7	500	20.91	...
WORCESTER.						
D Pendock Rectory [Tewkesbury]..	Rev. W. A. Strong ...	5	4 9	95	21.45	161
Blockley	R. B. Belcher, Esq. ...	5	1 0	472 ∇	27.24	...
Northwick Park	Lady Northwick	8	1 6	410 ∇	25.66	...
Upton-on-Severn (Willow Bank)	J. S. Cowley, Esq.	5	1 4	...	23.83	148
D Evesham (Lansdowne)	R. Burlingham, Esq.	5	5 0	124 ∇	23.57	124
D „ (Bank)	T. J. Slatter, Esq.	5	1 0	120 ∇	26.16	173
D† Great Malvern (Hornycold Road)	H. Sandoe, Esq.	5	0 7	550 ∇	27.95	164
† „ „ (Church Street) ...	J. E. Palmer, Esq.	5	1 0	361 ∇	25.86	...
† „ „ (Davenham Bank) ..	Mr. A. Bradshaw	8	1 0	290 ∇	24.13	...
D† „ „ (Belle Vue House) ..	D. B. Coldwell, Esq. ...	5	4 0	520	25.99	181
D „ „ (Malvernbury) ...	R. B. Johnson, Esq. ...	6	1 0	389 ∇	25.48	138
† „ „ (Madresfield Rect.)	Rev. G. S. Munn	5	1 4	124 ∇	24.54	...
† „ „ („ „ Court)	Mr. W. Crump	8	2 6	135 ∇	24.65	151
D† Worcester (Diglis Lock)	H. J. Marten, Esq., C.E.	5	1 0	49 ∇	22.59	209
D „ (St. George's Square)	G. B. Wetherall, Esq. ...	5	1 6	56 ∇	22.74	174
D „ (Water Works)	S. G. Purchas, Esq. ...	12	2 6	54	19.10	133
D† „ (Bevere Lock)	H. J. Marten, Esq., C.E.	5	1 1	52 ∇	22.73	170
D „ (Hawford Lodge)	F. Ames, Esq.	5	1 1	...	27.01	110
D† Droitwich (Holt Lock)	H. J. Marten, Esq., C.E.	5	1 1	55 ∇	23.61	160
D Tenbury (Orleton)	T. H. N. Davis, Esq.	5	0 9	193 ∇	25.91	178
D Redditch (Prospect Hill)	H. Page, Esq., M.D.	5	1 0	420 ∇	26.83	174
D Bromsgrove (Stoke Reformatory)	Mr. J. Salter	5	1 3	225 ∇	22.75	140
D „ (Tardebigge Res.) ...	F. A. Jones, Esq. C.E.	5	3 0	433 ∇	28.25	161
D† Stourport (Lincombe Lock)	H. J. Marten, Esq., C.E.	5	1 0	62 ∇	24.23	178
„ (Hartlebury)	J. Watson, Esq.	5	1 6	320	24.51	...

DIVISION VI.—WEST MIDLAND COUNTIES—(continued.)

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which ·01 or more fell.
		Diameter	Height above Ground.	Height above SeaLevel	1889	
WORCESTER—(con.)						
Stourport (Areley Court)	F. F. Harrison, Esq....	5	1 0	145 T	22·85	176
^D Bromsgrove (Lower Bittal Res.)..	F. A. Jones, Esq. C.E.	5	3 0	430 T	27·73	193
^D Bewdley (Winterdyne Gardens)	Mr. W. Wrather	8	2 0	...	25·74	133
^D Kidderminster (Woodfield)	Rev. J. R. Burton	5	3 0	167	24·03	154
Stourbridge (Pedmore)	E. B. Marten, Esq., C.E.	8	0 11	350 T	28·02	191
„ (Longlands)	H. „ „ „	8	1 0	260 T	34·10	162
Acocks Green [Birmingham] ...	H. Grosvenor Hill, Esq.	5	1 0	429 T	27·59	182
WARWICK.						
^D Shipston (Compton Wynyates)...	J. Sargent, Esq.....	5	2 6	...	26·51	176
Radway (Ivy Lodge).....	Rev. G. Miller	5	1 1	530 T	28·13	165
^D Farnborough Vicarage	Miss Prater	5	1 0	520	32·96	185
Kineton (Fenny Compton)	Mrs. Knott	5	4 0	436	25·18	...
^D Stratford on-Avon (Guild Street)	Rev. F. Smith	12	4 0	135 T	24·08	177
^D Warwick (Barford Rect.)	Rev. C. Mills.....	8	0 11	167 T	24·61	178
^D „ (Priory Gardens)	Mr. R. Greenfield	5	4 2	240 T	25·65	164
^D Southam (Stockton)	Rev. W. Tuckwell.....	5	1 0	289	24·84	179
Leamington (The Parade).....	J. Barnitt, Esq.	5	0 8	195 T	23·28	164
Henley-in-Arden (Barrells Park)	T. H. G. Newton, Esq.	5	1 0	318 T	32·65	178
^D Kenilworth (Park Hill).....	T. G. Hawley, Esq. ...	8	0 8	300	25·86	177
^D „ (The Spring)	W. Evans, Esq.....	5	1 0	312 T	25·77	184
Rugby School	H. P. Highton, Esq....	5	1 3	383 T	27·29	204
^D Coventry (Ryton on Dunsmore) ..	Mr. Franklin	5	1 2	260 T	24·13	186
„ (Priory Row)	J. Gulson, Esq.	8	1 3	279 T	27·15	176
^D „ (Middlesboro' Terrace).	Miss Merry	5	1 0	345 T	26·84	172
„ (Stoke)	J. Gulson, Esq.	8	1 3	241	26·09	183
^D „ (Coundon)	Colonel Caldicott	8	1 11	375 T	28·25	177
^D Birmingham (Sheldon Rectory) ..	Mrs. Jones Bateman ...	8	1 0	...	27·21	163
^D † „ (Botanic Gardens) ..	Mr. Latham	5	5 2	505 T	26·02	178
^D „ (The Crescent)	J. J. Gilbert, Esq.....	5	21 0	495 T	25·37	167
„ („ „ „)	„ „ „ „	5	7 0	480 T	26·98	...
^D Castle Bromwich Hall	Mr. E. Gibson	5	1 2	...	28·50	197
Nuneaton (Wesley House)	Rev. J. Watson	8	1 0	270	28·77	...
Sutton Coldfield.....	C.F. Marston, Esq., C.E.	5	1 0	394	29·88	163
^D Atherstone	Baldwin Latham Esq. CE	5	1 0	286 T	26·67	180

DIVISION VII.—NORTH MIDLAND COUNTIES.

LEICESTER.

D Market Harborough (Fairlawn)...	R. Symington, Esq. ...	8	4 0	324 T	24·12	177
Fleckney	J. B. Putt, Esq.....	5	1 0	411 T	27·32	...
D† Kibworth Beauchamp	T. Macaulay, Esq.....	5	2 6	355 T	27·81	183
D Leicester (Town Hall Square) ...	E. G. Mawbey, Esq., C.E.	9	1 7	212 T	23·86	150
„ (Humberstone Asylum)	J. E. M. Finch, Esq., M.D	6	1 0	244 T	25·53	168
D† Thornton Reservoir	F. Griffith, Esq., C.E..	8	1 2	371 T	27·19	151
D Barkby	Rev. E. N. Pochin	8	0 10	221 T	27·79	197
D Thurstaston Rectory	Rev. T. A. Preston ...	5	1 0	253 T	26·65	165
D „ (Cropston)	F. Griffith, Esq., C.E..	8	1 0	246 T	28·47	171

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which "01 or more fell.
		Diameter	Height Above Ground	Height Above Sea Level	1889	
			ft. in.	feet.	inches.	
LEICESTER—(con.)						
Swithland (Roecliffe).....	F. Griffith, Esq., C.E..	8	1 0	...	28·37	184
"	" " "	8	1 0	...	27·96	171
" (The Brand)	" " "	8	1 0	...	29·07	186
" (Broombriggs Hill)...	" " "	8	1 0	...	28·33	194
D Ratcliffe College.....	Rev. J. Hirst	5	3 9	310 T	27·46	180
D Rotherby Hall	J. Hames, Esq.	5	1 0	250 T	27·54	204
D Melton Mowbray (Thorpe Arnold)	Rev. J. S. Swift.....	8	2 3	336 T	27·85	153
D Loughborough (Nan Panton Res.)	A. W. Cross, Esq., C.E.	8	2 11	269 T	27·84	155
" (Cedar Cottage)...	J. Giles, Esq.	5	0 9	327 T	30·79	...
D " (Victoria Street)..	W. Berridge, Esq.....	5	0 10	169 B	27·13	179
" " " " "	" " "	8	0 11	169 B	27·09	179
D Waltham-le-Wolds	Mr. E. Ball	5	1 6	532 T	31·43	187
D Harston [Grantham].....	Mrs. Beasley	...	1 3	...	26·88	156
D†Belvoir Castle	W. Ingram, Esq.	8	1 0	237 T	32·42	195
D Bottesford	Rev. R. M. Norman ...	8	0 8	...	26·84	155
RUTLAND.						
D Uppingham (West Deyne)	Rev. G. H. Mullins ...	8	1 6	485 T	25·26	181
D Ketton Hall [Stamford]	F. Coventry, Esq.	5	1 0	130 B	28·06	205
Oakham (Whitwell)	Rev. J. Beecheno	5	1 0	320	21·69	...
D Toilethorpe Hall [Stamford].....	C. O. Eaton, Esq.	8	0 8	160 T	25·61	167
Burley-on-the-Hill	Mr. W. Temple	8	1 0	506	27·47	152
D Oakham (Ashwell Lodge).....	Westley Richards, Esq.	8	0 5	...	27·73	158
" (Greetham)	Rev. C. A. Holmes ...	5	0 4	377 T	27·72	143
D Market Overton.....	Miss H. E. G. Wingfield	8	0 11	475 T	27·69	215
LINCOLN.						
Stamford (Barn Hill Ho.).....	Dr. Newman	5	1 0	116 T	25·49	...
" (Castle Cottage).....	T. Booth, Esq.	5	1 0	...	26·47	...
D " (Northfields)	Mr. W. Hayes	5	1 0	166 T	29·69	162
D*Bourne (Wytham-on-the-Hill)..	A. C. Johnson, Esq. ...	5	1 0	167 T	26·19	116
Long Sutton	Mr. J. Tilson	5	4 0	...	25·12	170
Spalding (Pode Hole)	Mr. A. Harrison.....	12	0 3	20 T	26·50	...
D Grantham (Stainby)	Rev. W. Thorold	...	...	...	26·99	142
" (Little Ponton Rect.)..	Rev. P. R. Worsley ...	5	1 1	...	28·55	203
" (Saltersford).....	H. Preston, Esq.	5	0 6	188 T	27·17	176
"	S. G. Gamble, Esq., C.E.	5	13 6	202 T	25·40	180
" (Heydour Vicarage)..	Rev. G. F. Deedes.....	5	1 10	244 T	30·15	...
D Boston (Grand Sluice)	J. E. Williams, Esq., C.E	8	6 0	22	23·06	190
D "	W. H. Wheeler, Esq. C.E	5	4 0	16	22·60	163
Leake (Lade Bank Engines).....	J. E. Williams, Esq., C.E	...	...	...	23·79	158
D Wrangle	A. Spurr, Esq.	5	1 0	10	24·61	168
D Stubton [Newark].....	G. Nevile, Esq.	5	4 6	94 T	29·09	178
Sleaford (Bloxholm)	Mr. D. Lumsden	5	2 0	80	23·15	125
D Navenby	Rev. J. Hays	8	1 2	216 T	25·63	194
Kirkstead	Mr. R. H. Brett.....	5	1 2	...	25·14	...
D Skegness	H. V. Tippet, Esq.....	8	1 6	20 L	19·87	126
Horncastle (Miningsby)	W. H. Wheeler, Esq. C.E	5	0 6	135 T	24·40	121

DIVISION VII.—NORTH MIDLAND COUNTIES—(continued.)

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which "01 or more fell.
		Diameter	Height Above Ground	Height Above Sea Level	1889	
			ft. in.	feet.	inches.	
LINCOLN—(con.)						
D Spilsby	Dr. J. W. Walker.....	5	1 0	160 T	30·83	179
D „ (Hagworthingham)	Mr. R. Wright	5	1 1	252	27·26	181
D Horncastle (Bucknall)	W. Carter, Esq.....	5	1 0	100	25·16	146
„ (Queen Street)	H. George, Esq., M.D..	5	1 0	100	26·52	...
D Lincoln (Branston)	A.S.LeslieMelville, Esq	...	...	120	29·45	231
D† „ (Boultham)	Mr. F. Terrill.....	5	1 0	18 T	30·69	162
† „ (St. Botolphs)	H. Teague, Esq.....	5	1 0	25 T	26·82	...
„ (St. Catherine's)	J. H. Teague, Esq.....	5	5 0	33 T	29·30	...
D „ (Doddington)	Rev. R. E. Cole	5	1 2	92 T	27·51	181
„	M. S. & L. R. Co.† ...	9	3 6	26	26·01	172
„ (The Close)	Royal Meteor. Soc. ...	8	1 0	185	27·82	222
„ (D'Isney Place)	A.H.LeslieMelville Esq	4	1 0	215 L	28·57	146
D „ (Brayford Wharf)	Mr. J. W. Horton	5	5 8	28 T	28·48	191
„ (Tentercroft Street) ..	W. F. Norton, Esq. ...	8	1 3	22	26·65	144
„ (The Quarry)	R. Swan, Esq.	8	1 8	186 T	26·01	157
„ (Skellingthorpe Hall)...	R. C. B. Coupland, Esq.	5	1 1	...	26·28	147
D Horncastle (Hemingby)	Rev. E. S. Bengough..	5	1 0	158	30·00	183
D Alford (The Burial Ground).....	Mr. E. Hodgson.....	5	1 0	29 T	25·95	186
D „ (The Sycamores)	J. E. Mason, Esq.....	8	1 3	22 T	25·64	202
„ (Sutton-by-the-Sea)	F. Lowry, Esq., C.E.	5	1 0	9 T	21·60	143
D† Wragby (Hatton Rectory)	Rev. C. Burnell.....	5	0 9	117	28·09	194
D Farforth (Maidenwell House) ...	Miss H. E. Browne ...	5	1 0	380 T	31·19	218
Gate Burton	M. S. & L. R. Co.	9	3 6	96	24·88	154
Louth (Withcall)	R. Swan, Esq.	8	1 8	280 T	25·42	147
D† „ (Gospelgate)	T. W. Wallis, Esq. ...	5	6 0	111 T	30·02	173
† „ (Westgate)	Dr. F. Fawcett	5	0 9	120 T	30·52	181
D Market Rasen.....	Mr. W. B. Jevons.....	5	0 8	84	28·33	137
„ „	M. S. & L. R. Co.	9	...	100	27·00	132
Gainsborough.....	„ „ „	9	...	76	21·59	123
Stockwith	„ „ „	9	3 6	21	26·95	146
Caistor	Rev. R. Thomas	5	0 9	283 T	30·22	146
Wroot Engine	A. L. Peace, Esq., C.E.	10	6 0	...	22·68	138
Brigg	M. S. & L. R. Co.	9	3 6	16	22·30	181
D „	A. Atkinson, Esq., C.E.	8	1 2	10 T	25·29	155
Grimsby (Aylesby)	S. McAulay, Esq.	5	1 6	...	27·13	170
„	M. S. & L. R. Co.	9	15 0	42	23·14	140
Barnetby.....	„ „ „	9	3 6	51	25·67	164
D N. Level Engine [Thorne Donc'st'r]	A. L. Peace, Esq., C.E.	5	2 3	...	20·77	155
Crowle (Keadby)	M. S. & L. R. Co.	9	...	10	18·82	138
Appleby	Rev. J. E. Cross.....	5	0 9	60 L	25·43	162
D Burton-on-Stather Vicarage.....	Rev. F. A. Jarvis	5	0 6	210	23·98	176
Ferriby Sluice	Rev. J. E. Cross.....	5	0 9	10	25·99	...
New Holland	M. S. & L. R. Co.	9	3 6	18	20·36	161

† Kept for the Canals Department of the Manchester, Sheffield, and Lincolnshire Railway Company.
Returns supplied by G. Taylor, Esq.

DIVISION VII.—NORTH MIDLAND COUNTIES—(continued.)

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain. 1889	Days on which ·01 or more fell.
		Diameter	Height Above Ground	Height Above Sea Level		
			ft. in.	feet.	inches.	
NOTTS.						
d Kingston Hall [Loughborough]..	Mr. W. English.....	5	0 8	...	28·63	155
Cropwell Bishop (Cropwell Grove)	H. Smith, jun., Esq.....	5	1 1	160 †	28·34	...
d Stapleford Hall	Col. Ichabod Wright.	5	1 0	132 †	26·87	184
d Nottingham (Beeston Fields) ...	G. Fellows, Esq.	5	0 9	206 †	28·86	177
d " (Cromwell Street) ..	Miss L. E. Booker.....	5	0 6	191 †	27·01	...
d " (The Castle)	A. Brown, Esq., C.E....	8	1 2	192 †	25·61	150
d " (" ")	" " " "	8	76 0	268 †	22·87	146
d " (Stoke Bardolph Sew Fm)	Mr. J. Avis.....	8	6 7	80	27·03	170
d " (Strelley Hall)	T. L. K. Edge, Esq. ...	8	1 0	396 †	29·94	170
d " (Mapperley Hill) ...	E. Powell, Esq.	8	1 0	400	27·66	150
d " (Woodthorpe Grange)	H. Ashwell, Esq.	8	1 0	270 ?	34·60	152
Bulwell (Springfield).....	G. W. Walker, Esq.....	...	0 9	166	28·17	...
Newark (Shelton Rectory)	Rev. R. W. Marriott...	5	2 2	85	25·31	...
Eastwood Colliery	Mr. E. Lindley	5	38 0	282 †	27·10	188
d " " " "	" " " "	5	1 0	245 †	31·72	188
Newark (East Stoke)	Miss Stanton	5	1 3	...	26·72	160
d Hucknall Torkard (Forge Mills)	J. D. Walker, Esq.....	5	1 0	200 ?	25·12	174
Annesley Park	Mr. A. Young	8	2 6	560	31·90	152
Southwell (Oxton).....	Miss Sherbrooke.....	5	0 9	182	28·04	...
d " (Grants)	T. L. K. Edge, Esq. ...	5	1 0	97 †	26·96	195
d Newark (Kirkgate)	Mr. A. Read	5	1 0	50	25·05	156
Mansfield (Forest Villa)	S. W. Wright, Esq....	5	3 0	450	28·60	...
d " (Market Place)	The late Mr. W. Jackson	5	1 0	370 †	29·26	187
d Ollerton (Thoresby Gardens) ...	Mr. A. Henderson	8	4 0	175	25·13	152
d Tuxford (Ragnall).....	Rev. A. F. Claydon ...	6	1 0	32 †	25·68	152
Worksop	M. S. & L. R. Co.	9	3 6	127	23·86	144
Retford	" " " "	9	3 6	52	25·90	172
d " (Babworth Hall)	Col. Denison	5	0 6	92 †	24·35	166
d Worksop (Hodsock Priory)	H. Mellish, Esq.	8	1 0	56 †	25·71	180
d " (" ")	M " " " "	5	1 0	56 †	24·89	...
The " Gardens [Bawtry Hall] ...	L. T. Baines, Esq.....	5	1 0	31 †	22·03	...
d Hesley Hall [Tickhill]	B. I. Whitaker, Esq....	8	0 11	61 †	23·39	174
DERBY.						
d Stapenhill [Burton]	R. W. Abbotts, Esq....	5	4 0	170	27·98	195
d " ["]	A. J. Brown, Esq.....	5	1 0	...	28·34	...
d Melbourne (The Grange)	Miss Tasker	5	0 3	...	28·29	164
d " " " "	Mr. W. Garratt	5	1 0	182 †	26·91	139
d Willington	Rev. G. A. Smallwood	5	1 0	150 †	25·49	159
Derby (Findern)	Rev. B. W. Spilsbury..	5	0 9	186 †	23·19	...
d " (Etwall)	Mr. R. Giles	5	...	...	23·90	129
d " (Elvaston)	H. Chambers, jun. Esq	5	1 0	...	27·39	174
d Mickleover Manor	Mr. J. Campbell	5	2 0	200	24·76	146
d Derby (All Saints' Works)	Messrs. J. Davis & Son	5	1 0	174	26·23	177
d " (Midland Railway)	W. Langdon, Esq.....	5	4 6	148 †	25·61	176
d " (Duffield).....	Mr. W. Bland	5	1 0	250 †	26·29	144
d " (Holmside, Hazelwood) ...	C. H. B. Hambly, Esq.	5	1 3	500 †	27·88	179

DIVISION VII.—NORTH MIDLAND COUNTIES—(continued.)

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which -01 or more fell.
		Diameter	Height Above Ground	Height Above Sea Level	1889	
			ft. in.	feet.	inches.	
DERBY—(con.)						
Derby (Holmside, Hazelwood) ...	C. H. B. Hambly, Esq.	8	1 3	500	27·35	179
D „ (Breadsall Lodge)	W. B. Woodforde, Esq.	5	1 3	290 T	26·61	168
Belper (Hazelwood, Chevin)	Sir J. G. N. Alleyne, Bart.	5	4 6	545	25·02	155
D „ (Northfield)	J. Hunter, Esq., C.E.	8	0 8	225	31·60	179
† Matlock (Willersley Gardens) ...	Mr. Barlas	6	1 3	440 T	34·37	...
† „ Bath	Mrs. Chadwick	5	1 6	500 T	30·65	...
Stretton (Lindway Res.)	Mr. Pears	5	4 3	447 T	21·94	153
D Stuffynwood Hall [Mansfield] ...	J. Paget, Esq.	5	1 3	389 T	31·16	191
Chesterfield (Hardwick Hall) ...	Mr. Wilson	8	2 6	594 T	33·46	177
D Chatsworth Gardens	O. Thomas, Esq.	8	5 6	404 T	35·12	201
D Chesterfield (Gas Works)	C. E. Jones, Esq., C.E.	5	1 0	279	27·55	165
„	M. S. & L. R. Co.	9	3 6	248	26·82	171
D „ (Linacre Reservoir)	C. E. Jones, Esq., C.E.	8	3 6	490 T	29·20	156
D „ (Tapton House)	G. Parkes, Esq.	8	1 4	...	24·71	115
D† Buxton (Devonshire Hospital) ...	Mr. W. H. Beck	5	1 0	986 T	45·82	216
Stony Middleton	Mr. Wadlow	5	4 0	660	34·85	173
† Comb's Moss	M. S. & L. R. Co.	9	3 6	1669 T	32·84	...
† „ Reservoir	„ „ „	9	3 6	710 T	32·36	226
† Chapel-en-le-Frith	„ „ „	9	3 6	965 T	33·65	209
† Killamarsh (Norwood)	„ „ „	9	3 6	238 T	27·62	164
† Glossop (Spire Hollin)	F. Hawke, Esq.	8	0 10	612 T	38·64	...
Woodhead Station	M. S. & L. R. Co.	9	3 6	878 T	44·71	207

DIVISION VIII.—NORTH WESTERN COUNTIES.

CHESHIRE.

D Baddiley (Nantwich W. W.) ...	Baldwin Latham Esq CE	5	...	231	27·81	168
D Nantwich (Dorfold Hall)	J. A. Saner, Esq.	8	1 6	190	29·55	154
Crewe (Wistaston Road)	E. Pillow, Esq., C.E.	12	30 8	209	25·05	...
Eccleston	E. Wells, jun., Esq.	5	1 1	94 T	25·23	178
D Congleton (Buglawton Vic.)	Rev. W. Besant	8	5 0	347 T	32·75	182
Bosley Reservoir	M. S. & L. R. Co.	9	3 6	590 T	30·35	209
„ Minns	„ „ „	9	3 6	1210 T	33·02	215
Macclesfield (Wincle)	E. B. Smith, Esq., C.E.	5	3 0	500	37·53	176
D Chester (Rowton Grange)	T. R. Fleming, Esq.	5	1 0	164 B	26·01	183
D „ (Christleton Hall)	Mr. T. Weaver	5	1 2	142 T	27·22	196
D „ (Waterworks)	J. Dugdale, Esq.	5	0 10	85 T	25·50	198
D† „ (Newton Nurseries)	J. Dickson & Sons	5	1 0	62 T	26·98	191
Winsford (Meadowbank)	H. E. Falk, Esq.	4	4 0	90 T	32·38	146
Middlewich (Bostock Hall)	Col. France Hayhurst.	5	2 0	157 T	29·66	143
D Siddington (Thornycroft Hall) ...	Mr. J. Harrison	5	3 0	377	30·45	209
D Macclesfield (The Park)	Mr. J. Dale	5	1 0	501 T	33·69	198
D Chelford (Astle Hall)	G. Dixon, Esq.	5	1 0	250 T	29·53	170
„ „ „ M	„ „ „	8	1 0	250 T	30·15	...
D Northwich (Highfield)	J. A. Saner, Esq., C.E.	8	3 4	118 T	32·26	205
D „ (Winnington)	Mssrs Brunner Mond & Co	5	3 8	110 T	28·99	202
„ (Wincham Hall) ...	H. Neumann, Esq.	8	2 0	110	32·40	182

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain. 1889	Days on which 61 or more fell.
		Diameter	Height Above Ground	Height Above Sea Level		
			ft. in.	feet.	inches.	
CESHIRE—(con.)						
d*Neston (Hinderton)	Reginald Bushell, Esq.	5	1 0	215 T	30·14	193
* " " " " " " " " " "	" " " " " " " " " "	8	1 0	215 T	30·71	...
" " " " " " " " " "	" " " " " " " " " "	5	1 0	145 T	29·01	...
Frodsham (Fox Hill).....	J. Reynolds, Esq.	5	0 10	330 T	28·00	194
d " (Dunsdale)	J. Simpson, Esq.	5	1 1	206	29·00	192
d Knutsford (Heath Side)	W. Tyrer, Esq.	5	1 0	210	33·48	203
Bollington (Spond's Hill).....	M. S. & L. R. Co.	9	3 6	1279 T	30·48	...
Wilmslow (Southside)	G. Pearson, Esq.	8	2 0	255 T	31·73	...
d " " " " " " " " " "	" " " " " " " " " "	8	1 0	255 T	31·81	163
d " (Poplar House).....	J. Holden, Esq.	5	1 0	257 T	31·15	165
†Whaley	M. S. & L. R. Co.	9	3 6	602 T	38·61	219
Thurstaston (Dawpool).....	T. H. Ismay, Esq.	...	...	...	28·43	...
d Runcorn (Weston Point)	J. A. Saner, Esq., C.E.	4	2 4	18	28·44	160
d Hill Cliffe [Warrington]	J. Marson, Esq.	5	1 0	159 T	31·63	196
Bowdon (The Firs).....	R. Swindells, Esq., C.E.	5	0 8	215 T	30·59	...
d Thelwall (Highfields)	T. G. Rylands, Esq. ...	5	1 0	118 T	30·37	195
" " " " " " " " " "	" " " " " " " " " "	5	1 0	118 T	30·33	...
d " (Millington House).....	L. W. Reynolds, Esq..	5	1 0	82 T	31·50	201
d Lymm (Statham Lodge)	P. Stubs, Esq.	5	1 0	42 T	29·72	195
" " " " " " " " " "	" " " " " " " " " "	5	1 0	42 T	30·13	...
Altrincham (Norman's Place) ...	A. Griffiths, Esq.	5	1 0	150 T	33·37	168
d " (Dunham Lawn) ...	P. F. Jordan, Esq.....	5	1 11	207	32·82	171
d Cheadle (Harthill).....	R. A. Grundy, Esq. ...	5	1 0	142 T	29·23	180
d Hoyle (The Chase East)	J. F. Leigh Clare, Esq.	5	0 11	29 T	24·69	190
d†Birkenhead (Bidston Obs.)	J. Hartnup, Esq.	8	1 0	189 T	27·37	199
d Northenden (Wythenshaw)....	T. E. Tatton, Esq. ...	5	1 0	114 T	31·07	181
Marple Top Lock	M. S. & L. R. Co.	9	3 6	543 T	32·60	199
" Aqueduct	" " " " " " " " " "	9	3 6	321 T	29·59	191
Godley Reservoir	G. H. Hill, Esq., C.E..	12	...	500	31·24	...
Newton	M. S. & L. R. Co.	9	3 6	396 T	27·39	166
Mottram (Hill End)	" " " " " " " " " "	9	3 6	680 T	34·19	200
" (Matley's Field)	" " " " " " " " " "	9	3 6	399 T	32·45	189
d Hadfield (Millbrook).....	J. Sidebottom, Esq. ...	12	3 10	442 T	36·17	200
d " " " " " " " " " "	" " " " " " " " " "	8	3 10	442 T	35·49	200
Arnfield Reservoir.....	G. H. Hill, Esq., C.E..	12	2 6	515	35·45	...
†Rhodes Wood Reservoir	" " " " " " " " " "	12	1 0	520	42·35	...
†Torrside Reservoir	" " " " " " " " " "	12	1 6	680	44·31	...
Staleybridge (Swineshaw).....	" " " " " " " " " "	8	3 0	884 T	41·01	...
†Woodhead Reservoir.....	" " " " " " " " " "	12	0 10	660	45·14	...
LANCASHIRE.						
d Garston (Grassendale Park).....	Miss E. C. Abraham ...	5	1 0	35 T	29·88	191
d Aigburth (Kelton)	J. Sing, Esq.	5	1 0	135 T	30·42	183
d Warrington (Howley)	T. Longdin, Esq.	10	0 10	19 T	30·18	201
" (Cemetery)	" " " " " " " " " "	10	1 0	32 T	28·12	...
Liverpool (Grove Park)....	J. R. Darsie, Esq.	3	6 0	160	29·63	172
d " (Hope Street)	G. Jevons, Esq.	5	1 0	150	31·31	206
d " (St. James's Mount)...	Rev. W. Banister	5	1 1	150 T	32·83	181

‡ Returns supplied by C. R. Dykes, Esq.

DIVISION VIII.—NORTH WESTERN COUNTIES—(continued.)

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which ·01 or more fell.
		Diameter	Height Above Ground	Height Above Sea Level	1889	
			ft. in.	feet.			inches.
LANCASHIRE—(con.)						
† Blackstone Edge (Windy Bank)	Rochdale Canal Compy.	10	1 6	600	24·30	...
† " " " " " " " "	" " " " " " " "	10	1 9	1225	33·70	...
† " " " (Canal Summit)	" " " " " " " "	10	1 10	700	32·00	...
† " " " (Chelbourn) ...	" " " " " " " "	10	1 3	800	36·10	...
† " " " (Lenches)	" " " " " " " "	10	1 10	800	41·80	...
† " " " (Calf Lee)	" " " " " " " "	10	1 6	960	35·30	158
Chorley (Whittle-le-Woods) ...	Carlton Cross, Esq. ...	5	2 6	265 †	35·45	177
Haslingden (Holden Wood)	T. Rigby, Esq.	8	1 0	670	50·44	156
" (Calf Hey)	" " " " " " " "	8	1 0	800	49·53	158
Over Darwen (Sunnyhurst Hey).	T. Duxbury, Esq.	8	2 0	915 †	38 35	162
" " (Earnsdale Res.)...	" " " " " " " "	8	2 0	...	48·54	162
■ " " (St. James's Vic.)	Rev. W. H. Blamire ...	5	1 0	564 †	41·28	192
" " (Hoddlesden Res.)	J.B. McCallum Esq., C.E.	8	4 0	680	47·34	198
" " (Daisy Green)	" " " " " " " "	8	1 0	969 †	44·35	153
" " (Pickup Bank) ...	" " " " " " " "	8	1 0	720 †	42·63	155
Blackburn (Guide Reservoir) ...	" " " " " " " "	8	1 0	650	34·22	172
Oswaldtwistle Waterworks	R. N. Hunter, Esq. ..	10	0 6	635	41·43	179
■ Lytham (Woodville Terrace) ...	S. Stott, Esq.	8	2 1	...	29·09	241
Blackburn (Pleasington)	J.B. McCallum Esq., C.E.	8	2 6	232 †	35·44	...
" (Witton)	" " " " " " " "	8	2 6	315 †	36·73	189
" (Store Yard)	" " " " " " " "	8	30 0	373 †	29·78	176
" (Water Works Office)	" " " " " " " "	8	60 0	436 †	25·26	163
" (Pumping Station) ...	" " " " " " " "	8	6 0	600 †	37·08	169
■ Accrington (Washington House).	E. Knowles, Esq.	5	30 0	530 †	36·25	171
" (Milnshaw Grounds)...	Mr. Hargreaves.....	5	1 6	464 †	37·76	185
■ Preston (Corporation Offices) ...	H. Reah, Esq.	8	16 0	123	30·45	166
† Rawtenstall (Clough Bridge Res.)	T. Rigby, Esq.	8	1 0	900 †	38·62	208
Burnley Waterworks {	Causeway Side	8	2 0	1116	37·38	...
	† Sheddin	"	2 0	960	35·35	...
	† Cant Clough, S. Side	"	2 0	900	35·23	201
	† " " " N. Side	"	2 0	900	34·30	201
	† Rams Clough Head	"	2 0	1260	34·89	...
■ Huncoat (Burnley Road Res.) ...	C. Harrison, Esq.	9	1 6	620 †	39·23	201
Clayton-le-Moors (Oakenshaw)...	J. H. Calvert, Esq. ...	5	9 6	290 †	37·17	...
† Burnley (Yorkshire Street) ...	W. Williamson, Esq....	8	30 0	420 †	34·00	185
† " (Swinden, Upper)	" " " " " " " "	8	12 0	820 †	37·52	203
† " " " Lower)	" " " " " " " "	8	2 0	745 †	38·48	203
† " (Extwistle Moor)	" " " " " " " "	8	2 0	1310 †	37·69	...
" (Gawthorpe Hall)	Sir U.K. Shuttleworth Bt	8	0 9	316 †	35·95	160
■ Preston (Haighton)	J. J. Myres, Esq., C.E.	5	1 2	255 †	34·27	183
Alston	H. Reah, Esq.	8	1 2	320 †	32·45	...
Blackpool (South Shore)	G. Sharples, Esq.	10	1 8	29 †	29·62	...
"	J. Wolstenholme, Esq.	5	1 0	62 †	29·82	181
Kirkham (Weeton)	J. Bradley, Esq.	10	1 0	95 †	34·64	...
Nelson (Coldwell Reservoir).....	J. Newton, Esq., C.E..	8	2 0	950	27·75	...
■ Eccleston (Elswick Lodge)	S. King, Esq.	10	1 4	50 †	29·31	188
" { " " " } Field	" " " " " " " "	5	1 0	50 †	31·09	...
" { " " " } " "	" " " " " " " "	5	6 0	56 †	30·10	...

DIVISION VIII.—NORTH WESTERN COUNTIES—(continued.)

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which -01 or more fell	
		Diameter	Height Above Ground		Height Above Sea level		1889
			ft.	in.	feet.	inches.	
LANCASHIRE—(con.)							
d Stonyhurst College	Rev. W. Sidgreaves ...	11	1	0	376 π	42.48	207
" "	" " "	11	2	0	377 π	42.60	205
" "	" " "	11	1	0	376 π	42.51	...
Preston W. Works. {	Knowle Green	8	1	2	400 π	33.17	...
	Loud-scales	8	1	2	400 π	38.95	...
	Spade Mill	8	1	2	400 π	36.64	...
	Jeffrey Hill	8	1	2	900 π	43.70	...
d St. Michael's-on-Wyre No. 2 ...	Rev. P. J. Hornby	5	1	0	26 π	33.00	190
d " " No. 3 ...	" " " "	5	1	0	26 π	30.21	184
d Beaton Fell (Barnsfold Res.) ...	J. J. Myres, Esq., C.E. ...	5	1	6	506 π	38.35	209
" " (")	" " " "	5	1	6	506 π	38.10	...
d Garstang (Calder Mount)	C. Wilson, Esq.	5	10	0	110 π	31.40	200
" " (")	" " " "	5	1	0	71 π	32.81	...
Clitheroe (Downham Hall)	R. Assheton, Esq.	10	1	6	464 π	37.00	...
Chatburn (Middlewood)	W.K. Wilkinson, Jr. Esq. ...	5	1	3	363 π	38.51	161
Garstang (Barnacre Reservoir)...	J. Bradley, Esq.	10	1	0	617 π	41.35	...
" (Grizedale Reservoir)...	" " " "	10	1	0	519 π	39.25	...
Wyresdale (Abbeystead)	A. Creer, Esq., C.E. ...	8	1	0	366 π	44.18	157
" (Old Gauge Basin) M	" " " "	8	1	0	963 π	39.65	...
" (Wardstone)	" " " "	8	1	0	1440 π	49.20	...
Quernmore (Brow Top)	" " " "	8	1	0	552 π	36.45	...
d Lancaster (Southfield)	Miss Roper	12	3	6	114 π	37.79	174
" (Escowbeck, Caton)...	A. Greg, Esq.	10	3	0	150 π	35.75	157
Hest Bank	T. Ransome, Esq.	5	2	0	58 π	32.09	171
Melling (Hornby Castle)	Col. Foster	8	1	8	100	37.11	129
Barrow-in-Furness	W. Fergusson, Esq. ...	11	1	6	36 π	36.99	171
d† " (Cavendish Pk) ...	W.S. Whitworth Esq. CE	8	1	0	60 π	36.26	197
Arkholme (Storrs Hall)	F. F. Pearson, Esq. ...	5	1	0	220	42.87	...
d Ulverston (Urswick)	Rev. R. B. Billinge ...	5	2	6	...	41.11	180
† Cartmel (Holker)	Mr. W. Fox	8	4	8	155 π	38.45	179
Grange (Kents Bank House) ..	Eli Milnes, Esq.	5	1	0	20	38.09	178
d " (Nutwood)	Rev. E. Massie	5	2	6	100 π	38.54	200
d† Ulverston (Poaka Beck)	Mr. W. Fergusson	11	1	6	512 π	49.16	223
d Cartmel (Pit Farm)	Mr. W. R. Nash	5	1	0	122 π	41.40	194
" (Broughton Hall)	Col. Ainsworth	5	2	8	210 π	42.40	201
d Ulverston (Colton)	Rev. A. Christopherson	5	1	0	226 π	50.72	187
d Broughton-in-Furness	Rev. F. A. Malleeson ...	5	1	3	40	54.67	178
d Blawith	Rev. J. Ashburner	5	0	10	...	53.60	194
† Broughton (Woodland Rectory)	Rev. E. C. Shawfield ...	5	1	4	100 π	51.90	177
d Hawkshead (Grizedale Hall) ...	W.G. Ainslie, Esq., M.P.	5	1	0	325	58.02	187
d " (Esthwaite Lodge)	Major Alcock-Beck ...	5	3	6	232 π	57.72	209
" (" Strickland Ease)	" " " "	5	3	6	254 π	53.00	...
d† Duddon Valley (Seathwaite Vic.)	Rev. S. R. M. Walker	5	1	0	350 π	72.53	217
d† Monk Coniston Park	V. Marshall, Esq.	5	1	4	305 π	74.77	202
d Duddon Valley (Cockley Beck) ..	G.J. Symons, Esq. F.R.S	5	1	0	...	77.75	232

DIVISION IX.—YORKSHIRE.

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain. 1889	Days on which 01 or more fell.
		Diameter	Height above Ground.	Height above Sea Level.		
			ft. in.	feet.	inches.	
WEST RIDING.						
†Sheffield (Brincliffe Rise)	A. W. Chadburn, Esq.	5	1 0	500 T	29·73	159
† „ („ Edge)	M. S. & L. R. Co.	9	3 6	336 T	31·28	153
† „ (Redmires)	E. M. Eaton, Esq., C.E.	10	5 0	1110 T	38·53	205
„ „ („)	„ „ „	8	4 0	1110 T	38·65	...
D „ (Tylecote, Ranmoor) ...	J. Dixon, Esq.	10	3 6	610 T	36·62	163
D† „ (Broomhall Park)	D. Doncaster, Esq.	10	2 0	330 T	27·49	170
„ „ (Rivelin)	E. M. Eaton, Esq., C.E.	10	4 0	564 T	35·03	191
„ „ („)	„ „ „	8	4 0	564 T	34·88	...
† „ (Crookes)	„ „ „	10	2 0	629 T	26·15	166
† „ („)	„ „ „	8	2 0	629 T	26·56	...
D „ (Weston Park)	E. Howarth, Esq.	8	1 0	430 T	28·75	169
D†Rotherham (Ulley Reservoir) ...	Mr. L. Berry	5	1 0	184 T	23·68	133
†Sheffield (Victoria Station)	M. S. & L. R. Co.	9	3 6	188 T	23·27	155
† „ (Tinsley Locks)	„ „ „	9	...	143 T	22·83	138
Tickhill (Sandbeck Park) ...	Mr. G. Summers	8	1 0	150 T	27·26	166
†Rotherham (Moorgate Grove) ...	R. Chrimes, Esq.	5	1 0	262 T	24·77	178
„ „ (Thrybergh)	W.H.Crabtree, Esq. C.E.	8	1 0	184 T	22·61	145
D Tickhill	G. G. Phillips, Esq. ...	8	1 0	61 T	26·13	176
D Sheffield (Chapelton)	Mr. D. Bell	8	5 0	582 L	26·03	174
Doncaster (Firsby)	W.H.Crabtree, Esq. C.E.	8	1 3	189 T	29·42	167
„ „ (Wadworth Hall)	Rev. J. C. Ross	8	1 0	...	26·50	174
D „ („)	„ „ „	5	1 0	...	26·33	174
D Bolsterstone (Waldershaigh) ...	C. M. Wilson, Esq.	8	3 1	950 T	31·32	190
Wortley	M. S. & L. R. Co.	9	...	548	25·95	159
Elsecar	„ „ „	9	...	175 T	25·10	156
D Wath-upon-Deerne (Chapel St.)	Dr. Burman	8	1 0	185 T	25·88	175
D „ (West Melton)	W. Jackson, Esq.	6	0 10	172 T	25·47	129
Worsborough	M. S. & L. R. Co.	9	...	225 T	24·63	178
D Stainborough (Wentworth Castle)	W. Fisher, Esq.	8	2 6	520 T	27·70	170
Doncaster	M. S. & L. R. Co.	9	...	35 T	25·32	183
„ „ (Pumping Station) ...	W.H.Crabtree, Esq. C.E.	8	0 6	30 T	27·04	147
D „ „ (Magdalens)	Mr. J. Howorth	5	5 9	46 T	26·13	151
†Dunford Bridge Station	M. S. & L. R. Co.	9	3 6	954 T	39·97	179
† „ „ „ (Reservoir)	G. H. Hill, Esq., C.E.	12	2 0	1100 T	43·73	...
†Penistone (Carlcotes)	M. S. & L. R. Co.	9	3 6	1075 T	36·33	197
† „ „ „	„ „ „	9	3 6	717 T	30·46	176
„ „ (Hazlehead)	„ „ „	9	...	868 T	37·87	194
„ „ (Ingbirchworth Res.) ..	J. H. Taylor, Esq. C.E.	8	1 3	853 T	37·21	203
Holmbridge (Yateholme)	O. J. Kirby, Esq., C.E.	7	1 0	861	52·90	...
† „ „ (Wessenden Head) ...	J. Stanway, Esq.	8	...	1270	44·87	...
D Barnsley (Church Street)	Dr. Sadler	5	5 2	350 T	23·99	183
„ „ „	J. H. Taylor, Esq., C.E.	8	15 0	350	23·78	167
„ „ „	M. S. & L. R. Co.	9	...	175 T	22·54	171
†Saddleworth Station	M. W.B. Worthington, Esq.	5	4 2	630 T	39·54	...
Barnsley (Cawthorne)	Rev. C. T. Pratt	5	1 6	340 T	27·12	153
Strinesdale [Oldham]	G. H. Hill, Esq., C.E.	5	4 0	815	33·05	...
†Meltham (Harden Moss)	J. Stanway, Esq.	8	1 2	1212 T	41·07	...
Standedge (Castleshaw)	G. H. Hill, Esq. C.E.	...	...	876	39·41	...

DIVISION IX.—YORKSHIRE—(continued.)

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain. 1889	Days on which ·01 or more fell.
		Diameter	Height Above Ground.	Height Above Sea level		
			ft. in.	feet.	inches.	
WEST RIDING—(con.)						
† Standedge (Red Brook).....	W.B. Worthington, Esq.	8	1 8	1150	44·40	...
† Meltham (Brow Grains)	J. Stanway, Esq.	...	...	900	41·90	...
Denshaw (Ox Hey)	G. H. Hill, Esq., C.E..	...	...	1030	38·17	...
„ (New Year's Bridge)...	„ „ „	5	4 0	1012 †	40·24	...
„ (Ready Con Dean).....	„ „ „	...	...	1414	33·90	...
D† Meltham (Harewood Lodge).....	C. L. Brook, Esq.	8	4 10	514 †	34·96	193
D „ („ „).....	„ „ „	8	1 0	510 †	39·34	195
† „ Grange	J. Stanway, Esq.	8	1 2	850 †	35·69	...
† Marsden (Deer Hill)	„ „ „	...	...	1149 †	37·86	...
Doncaster (Hatfield)	Mr. T. Askren	5	5 4	...	20·50	160
„ (Kirk Bramwith)	B.S. Brundell, Esq. C.E.	5	1 0	17 †	23·69	186
D „ (Owston)	H. Ripley, Esq.	8	1 0	55 †	25·67	159
„ („ „).....M	„ „ „	8	1 0	56 †	24·52	...
D „ (Burghwallis Rec.) ..	Rev. F. W. Peel.....	5	1 0	80 †	25·95	187
„ („ „ „)M	„ „ „	5	1 0	80 †	24·13	...
D „ (Campsmount)	G. B. C. Yarborough, Esq	5	2 0	100	26·68	104
D† Slaithwaite (Blackmoorfoot).....	J. Stanway, Esq.	8	1 0	800 †	38·10	210
D† Honley (Northgate House)	Miss E. Brooke	5	1 0	350 †	34·31	195
† „ („ „ „).....M	„ „ „	5	1 0	350 †	32·88	...
D Wakefield (Walton)	E. Simpson, Esq.	5	1 0	150	26·07	180
Huddersfield (Bankfield, Golcar)	J. E. Ramsden, Esq....	5	1 0	400 †	33·71	176
D† „ (Dalton)	J. W. Robson, Esq.	8	1 0	350 †	29·50	175
Longwood (Bilberry Edge)	J. Stanway, Esq.	8	1 2	1090 †	30·69	...
D Pontefract (Purstone Hall)	P. C. Hall, Esq.	5	4 6	190 †	25·42	180
D Mirfield (Cote Wall)	E. B. W. Balme, Esq..	8	0 9	200	25·68	156
D† Wakefield Prison	Dr. H. Clarke.....	8	1 0	96 †	25·83	169
„ (Alverthorpe Hall) ..	H. Clarkson, Esq.	5	1 0	150 †	25·79	171
D Rastrick	J. T. Clay, Esq.	5	1 3	410 †	27·96	145
Pontefract (Fern Hill)	A. T. Barker, Esq. ...	5	2 0	120	24·38	..
D Wakefield (Field Head)	R. Porter, Esq.	8	1 6	250 †	23·17	161
D Goole	W. E. Grayburn, Esq.	5	1 0	18 †	21·51	156
Halifax (Bents, Norland)	J. S. Rawson, Esq. ...	5	0 8	800 †	32·39	...
D „ (Bermerside Observatory)	J. Gledhill, Esq. ...	8	0 6	500	29·61	181
„ (Thorpe)	J. S. Rawson, Esq. ...	8	0 8	345 †	38·10	...
D „ („ „).....	„ „ „	5	0 8	345 †	38·08	182
† „ (Albert).....	J. A. Paskin, Esq., C.E.	5	1 0	795 †	30·87	...
† „ (Gibbet).....	„ „ „	5	6 0	568 †	29·23	...
† „ (Ramsden Wood).....	„ „ „	8	1 2	816 †	36·38	...
D Leeds (Methley Park)	J. Richardson, Esq. C.E.	5	0 9	98 †	25·94	160
Hebden Bridge	A. R. Crossley, Esq....	4	1 0	479	41·29	215
Halifax (Castle Carr)	J. A. Paskin, Esq., C.E.	...	...	1060 †	36·05	...
† „ (Midgley Moor)	„ „ „	7	0 6	1350 †	41·32	...
† „ (Warley Moor)	„ „ „	7	0 6	1425 †	39·93	...
† „ (Ogden)	„ „ „	8	1 3	990 †	39·85	...
„ (Ovenden)	„ „ „	...	...	1375	39·45	...
„ (Widdop)	„ „ „	...	...	1050	39·60	...
† „ (Walshaw Dean).....	„ „ „	8	0 3	1380 †	39·92	...
D South Milford Rectory	Rev. F. J. Young	5	1 2	60 †	23·35	172

DIVISION IX.—YORKSHIRE—(continued.)

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which '01 or more fell.
		Diameter	Height Above Ground	Height Above Sea Level	1889	
			ft. in.	feet.	inches.	
WEST RIDING—(con.)						
Leeds (Wortley Res.)	T. Hewson, Esq., C.E..	8	0 9	307 π	23·88	160
Bradford (Queensbury).....	R. J. Foster, Esq.....	8	2 2	1050	33·74	125
„ (Brayshaw Reservoir) ..	A. R. Binnie, Esq., C.E.	5	1 0	982 π	32·88	186
D „ (The Exchange).....	J. McLandshorough, Esq	8	65 6	395 π	22·14	175
„ (Stubden) <i>old gauge</i> ...	A. R. Binnie, Esq., C.E. ..	8	1 0	1075 π	39·78	245
„ („)	M „ „ „ ..	5	1 0	1071 π	38·34	245
„ (Brown Royd Res.) ...	„ „ „ ..	5	1 0	385 π	20·94	149
„ (Nan's Scar)	M „ „ „ ..	5	1 0	1101 π	40·80	...
„ (Stairs)	M „ „ „ ..	5	1 0	1401 π	42·70	...
„ (Leeming Res.)	M „ „ „ ..	5	1 0	850 π	36·92	...
„ (Doe Park) <i>old gauge</i> ..	„ „ „ ..	8	1 0	810 π	35·07	242
„ („ „)	„ „ „ ..	5	1 0	811 π	33·12	242
„ (Leeshaw Res.)	M „ „ „ ..	5	1 0	875 π	38·51	...
„ (Chellow Dean)	„ „ „ ..	5	1 0	645 π	27·74	150
„ (Hewenden Reservoir) ..	„ „ „ ..	5	1 0	701 π	28·39	188
„ („ „) <i>old g.</i> ..	„ „ „ ..	5	1 0	700 π	31·32	188
„ (Heaton Res.) .. <i>old g.</i>	„ „ „ ..	8	1 0	530 π	26·24	176
„ („ „) ..	„ „ „ ..	5	1 0	531 π	25·10	173
D Leeds (Holbeck)	J. Marshall, Esq.	5	1 8	95 π	21·71	145
D „ („ W. Works Depot)	T. Hewson, Esq., C.E..	8	0 9	93 π	22·12	164
D „ (Museum).....	E. R. Waite, Esq.....	8	46 0	180	20·99	153
„ (Woodhouse Moor).....	T. Hewson, Esq., C.E.	8	0 9	307 π	22·68	175
D „ („ Cliff)	R. Reynolds, Esq.....	5	1 0	330	23·56	196
D „ (Elmete Hall, Roundhay)	Sir J. H. Kitson, Bt....	5	1 6	400 π	26·19	174
„ (Weetwood Reservoir) ...	T. Hewson, Esq., C.E.	8	0 9	328 π	22·38	161
Shipley (Moor Head).....	G. Knowles, Esq.	8	10 0	500	21·44	...
D Leeds (Allerton Hill)	T. Fenwick, Esq., C.E.	5	0 7	418 π	24·77	187
„ (Lawns Wood, Adel).....	Mr. C. S. Irvine	5	1 0	475 π	22·84	153
D „ (Oliver Hill, Horsforth)...	C. France, Esq.....	3	0 9	250 π	24·34	188
Bingley (Gilstead Filters)	A. R. Binnie, Esq., C.E.	5	1 0	572 π	22·31	197
Leeds (Eccup South).....	T. Hewson, Esq., C.E..	8	0 9	390 π	25·11	177
„ („ East)	„ „ „ ..	8	0 9	375 π	26·48	175
† Bingley (Sunnydale).....	A. R. Binnie, Esq., C.E.	5	1 0	975 π	25·61	172
Harewood (Arthington)	T. Hewson, Esq., C.E.	8	0 9	139 π	24·47	173
D Boston Spa	Rev. P. M. Eastman ...	5	1 0	...	24·73	165
Skipton (Gill Grange, Silsden) ...	M A. R. Binnie, Esq., C.E.	5	1 0	883 π	27·26	...
D Ilkley	G. W. Worfolk, Esq... ..	5	1 6	312 π	29·59	155
† „ (Cherry Bank)	H. Richardson, Esq.	8	1 3	600	33·18	...
Skipton (Silsden Reservoir)	A. R. Binnie, Esq., C.E.	5	1 0	560 π	25·11	168
D Thornton-in-Craven	C. S. Wilson, Esq.	5	5 4	456 π	30·35	202
Leathley (Lindley Wood S)	T. Hewson, Esq., C.E..	8	0 9	312 π	26·28	196
„ („ „ N).....	„ „ „ ..	8	0 9	320 π	26·67	196
Slaidburn (Hareden Brook)	H. Reah, Esq.	8	1 2	540	60·73	...
„ (Langden Brook)	„ „ „ ..	8	1 2	556	60·68	...
„ (Whiteholme)	W. K. Wilkinson, Esq.	5	1 3	475 π	44·37	144
Skipton (Cringle's Reservoir) ...	A. R. Binnie, Esq., C.E.	5	1 0	760 π	26·90	168
„ (Counter Hill)	M „ „ „ ..	5	1 0	951 π	26·48	...
„ (Chelker Reservoir) ...	M „ „ „ ..	5	1 0	730 π	28·31	...

DIVISION IX.—YORKSHIRE—(continued).

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain. 1889	Days on which ".01 or more fell.
		Diameter	Height Above Ground	Height Above Sea Level		
			ft. in.	feet.	inches.	
WEST RIDING—(con.)						
†Skipton (<i>Craven Herald</i> Office)...	E. Townsend, Esq.	8	0 8	360	29·16	167
Slaidburn (Dunsop Houses)	J. B. McCallum Esq., C.E.	8	1 0	450 T	59·06	176
„ (Middle Knoll)	„ „ „	8	2 6	1298 T	56·32	...
„ (Brennand)	„ „ „	8	1 0	820 T	66·78	183
„ (Whitendale)	„ „ „	8	1 0	830 T	69·79	181
„ (Cabin Hill)	„ „ „	8	3 1	1559 T	64·26	...
„ (Baxton Fell)	„ „ „	8	2 6	1540 T	47·37	...
York (Phil. Soc. Gardens)	The Meteor. Council ...	8	1 9	53 T	23·03	173
„ („ „ „)	„ „ „ „	8	...	53 T	23·40	178
D „ (Bootham)	J. E. Clark, Esq.	5	0 5	50	23·53	152
D „ (Cherry Hill)	H. Richardson, Esq. ...	5	1 6	60 T	23·37	171
D Wetherby (Ribston)	Mr. Jones	5	1 2	130 T	23·69	130
Fewston (Swinsty E)	T. Hewson, Esq., C.E.	8	0 9	460 T	32·27	185
„ („ W)	„ „ „	8	0 9	425 T	31·13	185
„ (Timble)	„ „ „	8	0 9	720 T	30·33	226
„ South	„ „ „	8	0 9	525 T	29·06	205
„ North	„ „ „	8	0 9	525 T	28·41	205
„ (Spinksburn)	„ „ „	8	0 9	620 T	26·80	204
Blubberhouses	„ „ „	8	0 9	575 T	31·25	207
D†Harrogate (West End Park) ...	J. H. Wilson, Esq.	5	1 0	412 T	23·08	173
„ (Service Reservoir) ..	E. W. Dixon, Esq. ...	8	3 6	455	20·18	...
„ (Haverah Park Res.) ..	„ „ „	8	3 6	620	19·65	...
„ (Bearer Dyke Res.) ...	„ „ „	8	3 6	570	23·46	145
Skipton (Barden Res.) <i>old g.</i> ...	A. R. Binnie, Esq., C.E.	8	1 2	746 T	37·02	234
„ („ „)	„ „ „	5	1 0	746 T	37·20	234
Otterburn-in-Craven	W. Gomersall, Esq. ...	5	1 0	510 T	31·87	159
West End	T. Hewson, Esq., C.E.	8	0 9	787 T	35·81	214
„ „ (Thruscross)	„ „ „	8	0 9	900 T	31·71	219
Skipton (Upper Res., Barden) ...	A. R. Binnie, Esq., C.E.	5	1 0	1250 T	34·54	204
„ (Thorpe Fell „) ... M	„ „ „	5	1 0	1661 T	24·44	...
„ (Sandbed Beck, Burnsall) M	„ „ „	5	1 0	676 T	33·73	...
†Knaresborough	Mr. G. Paul	5	1 0	214 T	26·50	194
„ (Conyngh'm Hall)	B. T. Woodd, Esq.	5	1 2	190 T	25·27	127
D „ (Farnham)	R. Elmhirst, Esq.	5	1 0	170 T	22·81	185
D Settle (Ashfield Gardens)	Mr. T. Green, Junr. ...	5	2 6	483 T	34·40	199
D „ (The Terrace)	J. W. Shepherd, Esq. ..	8	1 2	525 T	34·68	201
D†Pateley Bdg. (Castle Stead)	G. Metcalfe, Esq.	5	1 0	410	33·45	198
„ „ (Grimwith Res) <i>old g.</i> ...	A. R. Binnie, Esq., C.E.	8	1 0	890 T	36·90	218
„ „ („ „)	„ „ „	5	1 0	893 T	36·94	218
„ „ („ „ Trunla Hill) ... M	„ „ „	5	1 0	1201 T	28·83	...
D†Malham Tarn	Mr. Coulthard	5	1 0	1296 T	53·02	232
†Ripon (North Lodge)	F. D. Wise, Esq.	5	1 0	120	22·27	...
D „ (W. W. Lumley Moor) ...	Mr. J. Shepherd	...	...	...	24·91	135
†Ramsgill (Bouthwaite)	T. Hewson, Esq., C.E.	8	0 6	500 T	36·95	194
D†Arnccliffe	Ven. Archdeacon Boyd	8	2 9	734 T	49·60	191
†Nidderdale (Middlesmoor)	T. Hewson, Esq., C.E.	8	0 9	600	37·33	192
Ripon (High Bank, Mickley) ...	Miss Harrison	5	1 0	225 T	25·02	...
Oughtershaw Hall	C. H. L. Woodd, Esq. ..	8	1 6	1175 T	55·31	204

DIVISION IX.—YORKSHIRE—(continued.)

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which '01 or more fell.
		Diameter	Height Above Ground	Height Above Sea Level	1889	
			ft in.	feet.	inches.	
WEST RIDING—(con.)						
n† Sedbergh (Brig Flatts).....	J. Handley, Esq.	5	1 0	300 T	44·22	199
† „ (Thorns Hall)	Miss Sedgwick ...	5	1 0	400 T	43·74	202
EAST RIDING.						
Patrington (Spurn Head)	The Meteor. Council ...	8	1 0	27	19·02	181
D „	W. B. Pugh, Esq.	5	3 0	46 T	24·15	162
Hull (Nelholme, Ferriby).....	W. R. King, Esq.	5	5 0	125 T	23·37	...
„ (Westcott Street)	Rev. H. P. Slade	5	5 0	8	25·88	...
D „ (Derringham)	W. Lawton, Esq.	5	2 2	10 T	23·29	196
D „ (People's Park)	Mr. E. Peak	5	0 6	6	23·81	191
D Hedon (The Vicarage)	Rev. J. H. Richardson	5	1 0	...	23·30	188
Brough (Brantinghamthorpe) ...	Mr. R. C. Kingston ...	5	2 0	150 T	29·50	...
D Cottingham	J. H. Hill, Esq.	8	1 3	26	25·42	197
Market Weighton (Houghton)...	Canon J. Wells	5	1 0	175 T	26·35	...
Beverley (Alexandra Terrace) ...	T. Dyson, Esq.	12	8 0	64 T	23·02	156
D „ (Hull Bridge).....	J. Tiffen, Esq.	5	2 6	11 T	23·99	185
D Market Weighton (Dalton Hall)	Mr. J. Allsop	8	1 4	150 T	27·22	157
D Middleton-on-the-Wolds	Rev. H. D. Blanchard..	5	1 0	150 T	27·08	197
D Brandesburton (Hempholm).....	J. Tiffen, Esq.	5	2 6	11 T	24·97	181
D Pocklington (Warter)	J. Coxon, Esq.	5	1 10	230 T	27·59	185
„ Catton Rectory [York]	Rev. H. L. Puxley ...	5	1 0	50 T	23·42	...
D Driffield (Beverley Road).....	Rev. J. T. Harwood ...	8	8 0	68 T	25·05	193
„ (York Road)	J. Lovel, Esq.	5	1 0	76 T	25·33	184
D „ („ „)	„ „ „	5	1 0	76 T	25·44	184
Wetwang	Rev. E. M. Cole	5	1 0	235 T	26·32	166
D Lowthorpe (The Elms)	H. Onslow Piercy, Esq.	5	1 0	63 T	28·33	197
Bridlington Quay	Mr. J. Draffin	5	2 0	30 L	24·45	...
D Hunmanby (Foxholes Rectory)..	Rev. R. H. Foord	5	1 0	234 T	35·59	211
„ (Wold Newton)	Rev. T. S. Ackland ...	5	1 6	194	35·25	179
NORTH RIDING.						
† Malton	H. Hurtley, Esq. ...	10	1 0	75 T	23·98	...
D Melmerby (Baldersby)	W. Gregson, Esq.	5	1 0	101 T	22·08	141
Oswaldkirk (The Hermitage) ...	E. C. Munby, Esq. ...	5	0 8	425	26·29	...
D Thirsk (Sowerby)	C. M. Swarbreck, Esq..	5	1 0	105 T	22·30	160
D „ („ „ Rose Cottage)..	A. C. Bamlett, Esq. ...	5	1 0	118	22·67	162
D Masham (Burton House)	B. Carter, Esq.	6	1 0	269 T	25·68	142
D Pickering (The Rectory)	Rev. G. H. Lightfoot..	5	1 6	150	27·58	177
D Bedale (Thorpe Perrow)	Mr. W. Culverwell ...	5	1 6	170	22·65	155
† Hawes Junction	The Meteor. Council ...	8	1 0	1135	55·49	224
† Aysgarth Vicarage	Rev. F. W. Stow	3	1 0	659 T	30·03	...
D „ (Carperby)	J. Willis, Esq.	...	...	...	32·36	181
† Leyburn	G. W. Wray, Esq.	7	1 0	660 T	30·48	...
† „ (Bolton Hall)	Mr. E. Hall	8	0 8	420	29·40	...
D† „ („ „)	„ „ „	5	1 0	420	29·02	118
D Scarborough (West Bank)	W. Robinson, Esq.	8	1 0	160 B	28·72	198
Hambleton Hills (High Paradise)	A. C. Bamlett, Esq. ...	5	1 0	1050	25·76	...
n† Hawes (Hardrow Vicarage)	Rev. R. Pinck	5	1 0	790 T	36·08	196

DIVISION IX.—YORKSHIRE—(continued.)

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain 1889	Days on which ·01 or more fell.
		Diameter	Height Above Ground	Height Above Sea Level		
			ft. in.	feet.	inches.	
NORTH RIDING—(con.)						
*Northallerton (The Lodge)	J. Hodgson, Esq.	5	1 3	133 ∇	21·76	...
„ (Osmotherley) ...	J. Yeoman, Esq.	8	3 0	650	24·31	...
Richmond (The Grove)	G. Roper, Esq.	5	1 3	...	27·79	...
Northallerton (Rounton Grange).	The Royal Meteor. Soc.	8	1 0	250	25·37	184
Robin Hood's Bay (Fylingdales Vic)	Rev. R. J. Cooper	5	0 5	120	28·39	...
D Ingleby Manor	The Hon. H. Sidney ...	5	0 4	440 $\uparrow$	34·94	170
D „ Greenhow Vicarage.....	Rev. J. Hawell ..	5	1 0	448 $\uparrow$	30·55	185
D East Layton [Darlington]	Mrs. Proud	5	1 0	575 $\uparrow$	24·35	138
D Richmond (Forcett Park)	J. Michell, Esq.	5	1 0	360 $\uparrow$	25·72	183
Whitby (Guisborough Road) ...	M. Simpson, Esq.	5	2 0	184 ∇	26·94	146
„	T. Newbitt, Esq.	8	1 6	150 $\uparrow$	28·36	157
Bowes	G. J. Symons, Esq. F.R.S	8	1 0	...	27·45	...
Guisborough (Hutton Hall)	Sir J. W. Pease, Bt., M.P.	5	1 3	400 $\uparrow$	32·22	167
D „ (Lockwood Beck Res)	W. P. Anson, Esq., C.E.	8	1 0	632 ∇	37·36	164
D Middlesborough (Albert Park)...	T. Hallam, Esq.	8	2 0	30	23·06	172
D Mickleton	G. J. Symons, Esq. F.R.S	8	...	...	24·08	157
† „ (Lime Kiln Pasture) M	„ „ „	8	1 0	1175 $\uparrow$	22·95	...
† „ „ „ „ M	„ „ „	8	1 0	1175 $\uparrow$	26·70	...
Redcar (Kirkleatham)	W. Stainthorpe, Esq MD	...	...	...	26·65	166

DIVISION X—NORTHERN COUNTIES.

DURHAM.

D Darlington (Hurworth Grange)...	J. E. Backhouse, Esq..	5	1 0	161 ∇	23·82	177
„ (Dinsdale Rectory)...	Rev. J. W. Smith	5	2 0	54	24·07	167
D Egglecliffe [Yarm]	Rev. Canon Powell ...	5	1 0	...	20·31	122
D Darlington (South End)	Mr. N. Black ..	8	0 10	140	22·72	164
D† „ (Cleveland Parade)...	S. Hare, Esq.	5	1 0	160 $\uparrow$	22·01	175
D Barnard Castle (Whorlton)	Miss Dodgson	5	0 11	424 $\uparrow$	23·66	140
D „ „	E. Wells, Esq.	5	1 6	540	24·26	168
D Darlington (Brinkburn)	Mr. H. Waud	8	1 6	165 $\uparrow$	20·24	124
† Staindrop (Raby Castle)	Mr. R. Westcott	8	1 0	460 $\uparrow$	24·10	134
D Witton-le-Wear (Witton Tower)	W. R. I. Hopkins, Esq.	5	0 8	420 $\uparrow$	24·77	139
West Hartlepool	Mr. H. Lamb	5	30 0	45	21·86	125
D Hartlepool (Heugh Lighthouse)...	W. Belk, Esq., C.E. ...	5	0 6	34 ∇	21·94	175
D „ (Hurworth Burn) ...	T. Fenwick, Esq., C.E.	5	0 7	360	24·23	114
D „ (Hart Reservoir).....	„ „ „	8	0 9	164	21·58	103
D† Wolsingham	Mr. A. Mitchell	5	1 0	464 ∇	27·31	201
Tow Law	G. Hood, Esq., M.D. ...	6	4 0	1014	29·44	...
Durham	The Meteor. Council ...	12	4 0	340	20·66	176
D „ (Ushaw College)	Rev. J. Corbishley	5	0 10	600 ∇	22·15	159
Weardale W.W. (Waskerley 6)	R. Askwith, Esq., C.E.	8	4 2	1229 ∇	23·15	111
„ „ { „ 3)	„ „ „	8	4 6	1433 ∇	22·55	...
„ „ { „ 4)	„ „ „	8	4 7	1321 ∇	23·15	...
„ „ { „ 5)	„ „ „	8	4 2	1244 ∇	22·39	...
„ „ { „ 2)	„ „ „	8	4 5	1367 ∇	22·23	...
„ „ { „ 1)	„ „ „	8	4 4	1317 ∇	22·55	...
D Seaham Harbour Cemetery	Mr. R. Leith	8	1 7	150	24·82	204

DIVISION X.—NORTHERN COUNTIES—(continued).

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain. 1889	Days on which ·01 or more fell.
		Diameter	Height Above Ground	Height Above Sea Level		
			ft. in.	feet.	inches.	
DURHAM—(con.)						
Seaham Vicarage	Rev. A. Bethune	5	0 6	80 ↑	24·55	...
D „ Hall	Mr. R. Draper	5	1 0	100 ↑	26·57	118
Houghton-le-Spring (Myre Hall)	D. Balfour, Esq., C.E.	5	1 0	261 ↑	24·25	178
D Shotley Bridge	Mr. J. Coulson	5	1 0	345 ↑	29·58	150
D Chester-le-Street (Birtley)	R. C. Clephan, Esq. ...	5	0 9	205 ↑	23·94	189
D Sunderland (W. Hendon Ho) No. 5.	T. W. Backhouse, Esq.	5	1 0	130 ↑	23·43	158
D Gateshead (Eighton Cottage) ...	Miss Favell	5	2 6	515	25·29	167
D South Shields (Marsden)	J. Daglish, Esq.	5	0 3	225	25·45	161
NORTHUMBERLAND.						
D Haltwhistle (Shaft Hill)	Mr. R. Hetherington ...	5	0 9	626 ↑	30·29	133
D „ (Unthank Hall) ...	Rev. Dixon Brown	5	0 9	380 ↑	29·69	177
D Haydon Bridge (Ridley)	Rev. G. Reed	5	2 8	340 ↑	30·93	165
D Newcastle (Clifton Road)	R. Foster, Esq.	8	1 6	314 ↑	23·72	163
„ („ „)	„ „ „	5	1 0	314 ↑	24·73	...
D „ (Osborne Road)	T. G. Hurst, Esq.	5	0 9	170 ↑	25·11	161
„ (Philos. Society)	W. Lyall, Esq.	8	55 0	160 ↑	22·96	...
„ (Gladstone Terrace) ...	W. Smurthwaite, Esq. ..	2	6 0	156 ↑	24·38	126
D „ (Town Moor)	Mr. W. Neill	5	2 0	201 ↑	25·07	146
„ (Wellburn, Jesmond)	W. H. Holmes, Esq. ...	5	1 6	161 ↑	25·02	148
North Shields (Wallsend)	R. R. Dees, Esq.	10	0 6	100 ↑	24·27	...
„ (Post Office)	The Meteor. Council ...	8	1 4	100	23·39	167
D† „ (Rosella Place) ...	R. Spence, Esq.	8	1 0	124 ↑	24·72	171
D „ (Tynemouth)	P. J. Messent, Esq., C.E. ..	5	1 8	65 ↑	23·18	176
„ (Monkseaton)	T. Green, Esq.	5	4 0	132	23·66	...
Bingfield House	J. Coppin, Esq.	5	1 0	445 ↑	24·63	181
Newcastle and Gateshead W. Works Whittle Dean	G. Smith, Esq.	10	...	...	22·87	...
{ Swinburn (Woodford)	„ „ „	10	0 6	500 ↑	26·55	...
{ North Tyne (Green Crag) ...	„ „ „	10	0 6	800 ↑	25·74	...
{ „ „ Valley	„ „ „	10	0 6	300	23·62	...
{ Hallington	„ „ „	10	0 6	469 ↑	26·24	...
{ „ (Fawcett)	„ „ „	10	0 6	563 ↑	25·16	...
{ Gunnerton Burn (Camphill) ..	„ „ „	10	0 6	676 ↑	25·46	...
Cramlington	The Royal Meteor. Soc. ..	5	1 1	256	25·97	192
D Morpeth (Meldon Park)	Mr. J. Finlay	5	1 0	...	26·54	164
D „ (Bothalhaugh Garden) ..	Hon. & Rev. W. C. Ellis ..	5	0 10	35 ↑	25·80	208
„ { „ „ „) M	„ „ „	...	...	...	24·50	...
D „ { „ „ „) M	„ „ „	...	...	...	24·43	183
„ { „ „ „) M	„ „ „	...	...	...	23·79	...
Redesdale (Horsley)	G. Smith, Esq.	...	...	...	26·22	...
Rothbury (Brenckburn)	A. H. Cadogan, Esq.	8	1 2	257 ↑	26·58	...
„ (Craggside)	Lord Armstrong, C.B. ..	8	1 3	400 ↑	28·22	131
Redewater (Blakehope)	G. Smith, Esq.	...	...	...	28·22	...
„ (Chattlehope)	„ „	...	...	...	32·44	...
„ (Cateleugh)	„ „	...	...	...	30·66	...
D Alwinton (Harbottle Castle) ...	Mr. R. Elliott	5	1 0	500	29·81	162
„ (Biddleston Hall)	P. Dodds, Esq.	5	1 0	820 ↑	32·40	170
D Alnwick (Belle Vue House)	J. J. Horsley, Esq. ...	5	1	304 ↑	27·79	185

DIVISION X.—NORTHERN COUNTIES—(continued.)

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain. 1889	Days on which -01 or more fell
		Diameter	Height Above Ground		Height Above Sea Level	
			ft.	in.	feet.	inches.
NORTHUMBERLAND—(con.)						
Alnwick Castle	The Meteor. Council ...	5	0	4	178	29·70 181
„ (Glanton Pyke) ...	F. W. Collingwood, Esq. ...	8	4	4	517	26·18 ...
D Howick Hall	Rt. Hon. Earl Grey, K. G. ...	8	0	10	121 A	25·38 166
Ilderton (Lilburn Tower)	E. J. Collingwood, Esq. ...	10	6	0	300 T	28·91 ...
Cheviot (Broadstruther)	M. G. P. Hughes, Esq. ...	8	4	0	1574	56·50 ...
D Bamburgh	Mr. W. C. Good	5	1	0	75 L	25·02 168
D Pawston [Coldstream]	B. P. Selby, Esq. ...	8	1	0	328 T	31·09 194
Wooler (Milfield)	G. Grey, Esq. ...	5	0	6	200 A	26·87 ...
CUMBERLAND.						
D† Ulpha Vic [Broughton-in-Furness]	Rev. W. Kewley	5	1	3	175	70·04 220
Ravenglass (The Grove)	J. Ross, Esq. ...	5	2	6	80 A	39·39 135
„ (Irtside, Holm Rook)	J. D. Watson, Esq. ...	10	3	6	...	29·56 ...
D Eskdale	Rev. R. H. Snape	5	1	0	...	61·60 216
Braystones	W. H. Watson, Esq. ...	10	3	6	36	30·48 ...
Sprinkling Tarn	M. G. J. Symons, Esq. F.R.S. ...	4	...	6	1985	116·08 ...
Wastdale Head	M. „ „	4	0	6	204 T	87·35 ...
Styehead Tarn	M. „ „	4	0	6	1472 T	115·56 ...
† The Stye	M. „ „	4	0	6	1077 T	152·85 ...
† „ „ „ <i>New S.E. gauge</i>	M. „ „	4	1	0	...	138·73 ...
Gable Hawes	M. „ „	8	...	...	1077 T	70·85 ...
† Seathwaite	M. „ „	4	0	6	422 T	105·37 ...
D† „ „	„ „	5	1	0	423 T	106·24 209
„ „	The Royal Meteor. Soc. ...	5	0	10	422 T	103·89 208
*† „ „	M. John Marshall, Esq. ...	5	1	0	420 T	103·42 ...
Ullscarf	M. G. H. Hill, Esq., C.E. ...	7	1	0	2100 T	85·90 ...
D Whitehaven (The Floss, Cleator)	D. Ainsworth, Esq. M.P. ...	5	1	8	208 T	41·05 171
D† Wythburn Vicarage	Rev. Basil R. Lawson ..	5	1	0	574 T	76·01 169
† Helvellyn (Birkside)	M. G. H. Hill, Esq., C.E. ...	7	1	0	1900 T	64·10 ...
† Wythburn	M. „ „ „	7	1	0	580 T	70·60 ...
D Borrowdale Vicarage	Rev. J. Taylor	5	1	0	330 T	75·27 211
D† Buttermere (Hassness)	Mr. S. Stewart	5	1	0	355	84·26 224
D† Borrowdale (Grange)	Mr. Threlkeld	5	0	9	271 T	64·98 208
Armboth	G. H. Hill, Esq., C.E. ...	7	1	0	550 T	56·90 ...
„ Fells (The Pewitts)	„ „ „	7	1	0	1650 T	64·10 ...
Helvellyn (Whiteside)	„ „ „	7	1	0	2100 T	56·80 ...
† Whitehaven (Irish Street)	Dr. P. Anson	5	1	1	21 A	34·54 144
Arledon (Kirklandhow)	J. B. Wilson, Esq., C.E. ...	5	1	0	500 T	44·00 ...
D† Keswick (Barrow House)	Miss Langton	8	0	6	282	53·77 223
Loweswater (Waterend)	Mrs. Jackson	5	1	0	432 T	45·83 217
Ullswater (Hallsteads)	A. Marshall, Esq. ...	5	2	0	497 T	39·60 ...
† Keswick (Deer Close)	John Marshall, Esq. ...	7	1	9	300 T	44·83 208
† „ (Derwent Island) <i>...old</i>	„ „ „	5	0	7	280 T	39·15 243
„ „ „ <i>...new</i>	„ „ „	5	0	6	290	43·24 242
D† „ (Post Office=Bank)	J. F. Crosthwaite, Esq. ...	8	6	4	270 T	44·22 232
† „ „ „ „	„ „ „	5	1	0	265	42·74 232
D† „ (Shu-le-crow)	The late Miss Mitchell ...	5	0	7	296 T	45·64 212
Whitehaven (Gilgarron Hall) ...	Mr. D. Galloway	5	4	9	470 T	42·00 194

DIVISION X.—NORTHERN COUNTIES.—(continued).

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain. 1889	Days on which ".01 or more fell
		Diameter	Height Above Ground	Height Above Sea Level		
			ft. in.	feet.	inches.	
CUMBERLAND —(con.)						
d Cockermouth (Whinfell Hall) ...	W. Robinson, Esq. ...	5	2 0	265 A	42·88	227
d " (Brandlingill)	Col. F. R. Sewell	5	1 0	320 A	44·53	212
+ Threlkeld Rectory	Rev. J. Brunskill	5	4 0	488 T	39·17	191
" (Settra)	" " "	5	1 0	840	43·00	...
" (Blencathra)	" " "	5	1 0	1400	64·25	...
Skiddaw Forest (Shepherd's Ldge.)	" " "	5	1 0	1640	40·72	...
d+ Cockermouth (Derwent House)..	Mrs. Dodgson.....	5	...	144	35·41	151
d+ " (Higham)	Rev. Canon Hoskins ...	5	1 0	478 A	36·24	199
d " (Broughton Grange)	G. S. Wilson, Esq. ...	5	1 3	209 A	35·71	186
Penrith (Culgaith Vic.)..... <i>lawn</i>	Rev. G. W. Atkinson..	5	0 5	500 T	27·27	...
" " " " " " " "	" " " " " " " "	5	0 10	500 T	27·03	...
d " (Nandana)	G. Varty Smith, Esq...	5	4 0	625 T	25·37	197
+ " (Fell Lane, Fir Bank) ..	T. Lester, Esq.	5	1 0	575 T	26·03	165
" (Greystoke)	A. Tremayne Buller, Esq	5	...	700	33·53	...
d+ " (Newton Reigny).....	T. G. Benn, Esq.	8	1 0	580 A	28·76	190
+ " " " " " " " M	" " " " " " " "	8	1 0	580 A	28·82	...
d " (Edenhall Vicarage) ..	B. W. Lovejoy, Esq....	5	1 4	310 T	26·57	200
" (Kirkland Vicarage) ..	Rev. A. Edwards	5	...	640	33·41	...
d+ Blencowe School.....	T. Fawcett, Esq.	8	0 9	601 B	32·06	194
Maryport (Netherhall)	H. P. Senhouse, Esq...	8	0 6	27 A	34·15	148
d Kirkoswald (Melmerby)	Rev. A. C. Pittar ...	5	0 8	...	32·43	202
d Mealsgate (Uldale Rectory)	Rev. J. Greenwood ...	5	1 4	550	39·08	171
Hesket Newmarket	Mr. J. Wilson ..	5	1 0	600 T	35·25	...
d Aspatria (Brookfield)	M. Lidbetter, Esq.....	5	0 9	124 A	31·95	218
Carlisle (Wreay Vicarage)	Rev. T. Lees	5	2 0	310 T	26·64	206
d+ " (Cemetery)	S. Cartmell, Esq.	8	4 0	114 A	29·70	177
" (Rickerby House)	M. MacInnes, Esq., M.P.	8	1 2	50	26·58	...
d " (Castletown).....	Mr. A. Smith.....	5	1 6	...	26·89	147
" (Scaleby)	The Royal Meteor. Soc.	5	1 0	112	29·70	218
d Brampton (Denton House)	Mr. J. Charlton	5	1 2	541 A	30·33	208
WESTMORELAND.						
d Arnside	J. P. Drewett, Esq. ...	5	0 6	20	41·41	179
Kirkby Lonsdale	Mr. W. Harrison	5	1 2	209	39·80	...
Witherslack (Halecote)	Rev. J. E. Cross.....	5	1 0	100 T	44·50	...
d Kendal (Natland Park).....	Mrs. Shipley	5	1 0	160 T	43·43	203
" (Hill Top).....	C. J. Holdsworth, Esq..	5	1 0	560 B	44·18	195
d " (St. George's Vic.)	Rev. G. Crewdson	5	0 8	...	44·97	200
d " (Kent Terrace).....	R. J. Nelson, Esq.....	5	1 6	146 T	43·15	199
d " (Hawesmead)	G. F. Braithwaite, Esq.	8	0 6	175 A	42·91	199
" (Ellergreen)	J. Cropper Esq.	5	1 3	290 T	48·78	223
d Bowness (Fallbarrow)	Rev. A. Rawson	8	1 0	135 T	51·07	193
d Windermere (Woodland Terrace)	Rev. T. Mackereth ...	5	6 5	370	49·05	218
d Longsleddale	Rev. W. Burrows	5	1 0	512 T	59·24	199
d+ Ambleside (Nook Cottage)	Mr. E. Hird	5	1 0	227 A	58·91	217
+ " (Lesketh Howe)	F. M. T. Jones, Esq....	5	2 6	175 T	65·98	216
d+ Grasmere (High Close)	E. B. W. Balme, Esq...	8	0 9	553 T	62·07	213
d " (Pavement End)	T. A. Green, Esq.	5	4 8	218 T	60·49	212

DIVISION X.—NORTHERN COUNTIES—(continued)

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which ·01 or more fell.
		Diameter	Height Above Ground	Height Above Sea Level	1889	
			ft. in.	feet.	inches.	
WESTMORELAND—(con.)						
d Ravenstonedale (Brownber)	J. Fothergill, Esq.	5	3 0	826 T	31·83	174
Orton Vicarage	Rev. E. Holme	5	3 6	770 T	39·68	189
d† Kirkby Stephen	T. Mason, Esq.	5	1 0	574 T	29·25	175
† Shap (Sleddale Hall)	M. Mr. W. Hoggarth	5	1 0	1560 T	52·20	...
† „ (Swindale)	M. „	5	1 0	1610 T	63·55	...
Asby (Town Head)	Mr. J. Clemmet	5	1 0	685 T	34·41	182
d† Shap (Copy Hill)	Mr. W. Hoggarth	5	1 0	852 T	39·55	247
„ („ „)	M. „	5	1 0	852 T	39·53	...
Grisdale (Ruthwaite Lodge)	Mr. A. Milne	8	1 6	...	78·51	...
d† Patterdale Hall	„ „	7	1 3	490 T	61·16	201
† „ (Greenside Mine)	Mr. T. Taylor	7	1 6	1000 T	69·46	...
d† Crosby Ravensworth (Reagill)	Mr. Wilkinson	8	0 6	890 T	30·06	...
d† Appleby	Dr. Armstrong	5	1 0	442 T	27·71	194
Ullswater (Swarth Fell)	M. G. J. Symons, Esq. F.R.S.	8	1 3	1000 T	39·25	...
„ („ „)	„ „	5	1 0	1000 T	40·40	...
d Lowther Castle [Penrith]	Mr. F. Clarke	8	3 6	750 T	32·50	132
d Barton Hall [Penrith]	J. H. Cumpston, Esq.	5	...	...	32·63	115
d Milburn	Miss Robinson	5	1 0	644	30·13	194

DIVISION XI.—MONMOUTH, WALES, AND THE ISLANDS.

MONMOUTH.

D	Marshfield (Llwynarthan)	F. G. Evans, Esq.....	5	1	0	72 B	29-91	184
D	Chepstow (Shirenewton Hall) ...	E. J. Lowe, Esq., F.R.S.	8	0	8	530 T	32-42	161
D	„ (The Mount).....	H. A. Smith, Esq.....	5	1	0	150	29-96	172
D	Llanfrechfa Grange	F. J. Mitchell, Esq. ...	5	4	0	326 A	33-93	138
	Tredunnoch	Rev. C. T. Salusbury...	5	2	3	170 A	33-08	166
D	Chepstow (Piercefield Park).....	H. Clay, Esq.....	5	1	6	300	31-12	139
D	„ (Itton Court).....	E. Curre, Esq.	8	3	6	390	33-28	206
	Llangibby Rectory	Rev. F. L. Salusbury..	5	3	6	...	32-62	150
D	Usk (Porthycarne)	D. Lawrence, Esq.....	8	4	4	58	31-79	160
D	Tredegar (Bedwellty House) ...	J. Colquhoun, Esq. ...	8	1	6	972 A	39-99	146
D	„ (The Willows)	G. A. Brown, Esq.....	8	1	0	1024 T	41-56	190
	Blaenavon Gas Works.....	C. White, Esq.....	5	0	9	980	41-44	...
D	Ebbw Vale (The Firs)	R. S. Jordan, Esq.....	5	1	0	1060 A	37-99	172
D	Monmouth (The Hendre)	J. M. Rolls, Esq.	8	1	0	176 T	30-34	181
	Abergavenny (Larchfield)	Dr. Glendinning	5	1	0	240 B	30-41	179
	„ (Dyne House)	Dr. Steel.....	5	1	3	220	32-55	189
D	„ (The Chain).....	W. Baker Gabb, Esq...	5	2	6	250	33-29	202
D	Llantilio Court	Sir H. M. Jackson, Bt.	5	0	10	207 A	33-01	140
D	Monmouth (Pentwyn)	Rev. J. T. Harding ...	5	1	0	191 B	28-48	157

GLAMORGAN.

* Cowbridge (Fonmon Castle).....	O. H. Jones, Esq.	8	1	2	130	27.78	...
(The Ham)	I. B. Nicholl, Esq.	8	1	6	96 7	28.02	141
Cardiff (Cogan Pill, Landough)..	J. A. B. Williams, Esq. CE	5	1	0	122 7	28.42	165
,, Castle	Mr. A. Pettigrew	5	1	0	38 7	31.52	189

DIVISION XI.—MONMOUTH, WALES, AND THE ISLANDS—(continued).

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which ·01 or more fell.
		Diameter	Height Above Ground	Height Above Sea Level	1889	
			ft. in.	feet.	inches.	
GLAMORGAN—(con.)						
d Porthcawl (The Rest)	G. Evans, Esq.	5	1 0	60	29·04	156
Cowbridge (Ash Hall)	D. Owen, Esq.	8	1 0	315 A	35·25	184
d Cardiff (Ely)	J.A.B. Williams, Esq. CE	8	1 0	53 A	34·26	178
„ (Lisvane)	„ „ „	5	1 0	136 A	28·14	178
„ (New Filters, Heath)....	„ „ „	5	1 0	132	32·77	177
„ (Llanishen Res.)	„ „ „	5	1 0	155	31·62	179
d Pontypridd (Craig-y-nos Res.)..	Mr. W. Jones.....	5	0 4	1110	50·20	153
d Oystermouth (Newton)	Rev. S. Jones	5	0 9	279 T	35·21	203
d Swansea (Sketty)	T. T. Wood, Esq.	5	1 0	280	36·74	187
d „ (South Dock Lock).....	J. Dixon, Esq.	12	14 9	40	35·25	178
d Neath	E.C. Pole, Esq.	5	1 0	204 A	36·84	189
d Swansea (Morriston)	E. Rice Morgan, Esq. ..	5	1 0	89	39·22	176
d Neath (Fairy Land)	E. Ll. Green, Esq.	5	1 9	170 B	36·41	199
d† „ (Glyncorrwg)	T. F. Brown, Esq.	5	4 6	717	59·86	200
d Mountain Ash (Maesydderwen)..	M. Morgan, Esq.	5	1 0	483 A	42·16	190
Treherbert	Sir W. T. Lewis, C.E. ...	5	1 0	670	55·00	210
Castell Llwhwr (Penllergare)...	Sir J.T.D. Llewellyn, Bt.	5	3 6	240 T	37·51	182
Aberdare (The Mardy)	Sir W. T. Lewis, C.E. ...	5	2 2	431 A	42·04	187
d† „ (Abernant).....	Evan Jones, Esq.	5	4 6	425	34·35	134
d Felindre (Lliw Reservoir).....	R. H. Wyrill, Esq., C.E.	8	1 3	426 T	39·75	189
Dowlais (Cwm Bargoed)	G. A. Lundie, Esq., C.E.	5	1 0	1237 A	34·16	192
d Ystalyfera (Tan-yr-allt)	D. H. Lewis, Esq.	8	1 6	300 L	43·48	173
CARMARTHEN.						
d Llanelly (Cwmlledi W.W.).....	G. Watkeys, Esq., C.E.	5	3 0	240 A	40·76	203
Tegfynydd [Narberth]	H. S. Morgan, Esq.	5	1 0	158 A	38·82	134
d† Carmarthen (Joint Co. Asylum)..	Dr. Hearder	8	1 0	189 A	38·62	205
Llandilo (Dynevov Castle)	Rt. Hon. Lord Dynevov	8	1 0	202 T	37·33	171
d Llandovery	J. Watkins, Esq.	5	1 0	217 T	41·03	229
PEMBROKE.						
Pembroke (Stackpole Court).....	Rt. Hon. Earl of Cawdor	6	1 6	50 A	32·97	175
d Tenby (Manorbier Vic.)	Rev. J. L. Moore	5	1 0	...	28·12	127
St. Ann's Head	The Meteor. Council ...	8	0 8	150	27·04	199
d Haverfordwest (Picton Castle)...	Sir C. Philipps, Bart. ...	5	1 0	100	34·85	173
d* „ (High Street)	E. P. Phillips, Esq.	5	1 0	95 T	37·31	209
d Clarbeston (Penty Park)	Capt. F. Lloyd Philipps	5	1 0	320 T	38·37	165
d St. David's	Dr. W. P. Probert	5	1 0	216	28·67	193
d Castle Malgwyn [Llechryd] ...	Mr. F. Peppitt	5	1 0	...	33·57	170
CARDIGAN.						
d Troedyaaur Rectory	Mrs. Lloyd	5	1 0	140?	34·31	187
d Aberaeron (Dolaeron)	T. H. Maddy, Esq.	5	1 11	50	33·41	191
Aberystwith	Dr. Rees Davies	8	1 0	60	29·02	196
d „ (Goggerddan)	Sir Pryse Pryse, Bart. ..	5	1 0	80 B	48·09	194
d „ (Cwmsymlog)	Capt. Garland	5	3 0	800	54·42	178

DIVISION XI.—MONMOUTH, WALES, AND THE ISLANDS—(continued.)

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain. 1889	Days on which ·01 or more fell.
		Diameter	Height Above Ground		Height Above Sea Level	
			ft.	in.	feet.	inches.
BRECKNOCK.						
d†Nanthir Reservoir [Aberdare] ..	T. L. Edwards, Esq....	5	1	0	860 ∇	41·12
† " " ["] M	" " " " ..	5	1	0	860 ∇	41·40
d Colbren (Penwyllt)	G. Palmer, Esq.....	5	1	0	1108	50·71
†Cardiff W W (Cwm Taff Fawr No5)	JAB Williams, Esq. C.E.	5	1	0	1143 ∇	47·34
† " " (" " " " No1)	" " " " ..	5	1	0	2350 ∇	53·47
" " (Cantref Res) ...	" " " " ..	5	1	0	1120	48·68
† " " (Cwm Taff Fawr No6)	" " " " ..	5	1	0	1328 ∇	59·82
Crickhowel (Gwernvale)	Mrs. Lloyd	5	1	0	373 ∇	30·83
Brecknock (Cantref Rect.)	Rev. J. J. Evans	5	1	0	630 ∇	40·05
d " (Llandefaelog-fach) ..	Rev. W. Williams	5	1	1	660	33·95
d Hay (Gwernyfed Park)	Major Wood	5	1	0	350 ∇	29·50
d Builth (Llanwrtyd Wells)	Miss Jones ...	5	1	0	800 ∇	49·61
" (Vicarage)	Rev. A. T. Coore	8	1	0	520 ∇	33·41
d " (Abergwessin Vic.)	Rev. J. Jones	5	1	0	904 ∇	58·85
d Newbridge (Llys dinam)	Mrs. Lister Venables ..	5	1	3	640 ∇	29·90
RADNOR.						
Glasbury (Woodlands)	A. Battiscombe, Esq....	5	1	0	305 ∇	31·31
d Disserth (Glanhowey)	Rev. A. W. Powell ...	8	1	0	700 ∇	33·81
d New Radnor (Downton)	Col. Pearson	5	0	8	712	38·28
" " (Ednol)	Mr. W. Jones	5	0	8	930	40·19
Llandegley (Gwern-i-Arglwydd)	Mr. J. Campbell	5	0	8	1000	35·76
d Pen-y-bont	Mr. J. Hamer	5	0	8	750	30·22
d Rhayader (Nantgwillt)	R. L. Lloyd, Esq.	5	1	0	768 ∇	53·58
MONTGOMERY.						
Llangurig (Esgair Clochfan) ...	G. J. Symons, Esq., FRS	5	1	2	1330	54·40
† " (Ystrad-olwyn-fawr) ...M	" " " " ..	8	1	0	950	43·30
d Llanidloes (Broomcliffe)	E. Powell, Esq.	5	1	0	650 ∇	43·04
d Newtown (Dolfor)	W. B. Pugh, Esq.....	5	0	3	1027 ∇	33·91
d Churchstoke (Mellington Hall) ..	P. Wright, Esq.	5	1	6	540 ∇	31·36
" " " " ")M	" " " " ..	5	1	6	540 ∇	31·17
Dylife Lead Mine	G. J. Symons, Esq. F.R.S.	5	1	0	1400 ∇	58·10
d Carno (Llanwnog)	Rev. D. Parry	5	1	4	...	32·89
d† " (Tybrith)	Miss Marsh	5	1	0	595 ∇	42·14
d Welshpool (Powys Castle)	Mr. Huntley	8	1	6	...	32·38
Garthbibio ((Bwlch Tomlyd) ...	G. J. Symons, Esq., FRS.	5	1	2	1370	79·60
d Welshpool (Pool Quay Vic.)	Rev. R. J. Roberts ...	5	1	0	230 ∇	28·17
FLINT.						
d Hawarden	Dr. Burlingham	5	1	0	245 ∇	28·64
† Flint (Soughton Hall, Northop).	J. Scott Bankes, Esq... St. Asaph (Nantllys)	5	0	7	418	32·20
d† Halkyn	P. P. Pennant, Esq. ...	5	1	0	173 ∇	28·92
d Holywell (Bagillt)	Capt. Williams	5	1	3	895 ∇	32·67
d Rhyl (Sedgley House)	H. Barker, Esq.	5	1	6	20 ∇	29·08
	W. T. Girdlestone, Esq.	5	2	6	21 ∇	24·49

DIVISION XI.—MONMOUTH, WALES, AND THE ISLANDS—(continued).

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which ·01 or more fell.
		Diameter	Height above Ground.	Height above Sea Level	1889	
			ft. in.	feet.	inches.	
DENBIGH.						
Ruabon (Penycae Reservoir) ...	G. E. Woodford, Esq...	5	1 0	660 T	30·46	112
d „ (Belan)	Rev. G. M. Ashdown...	5	5 6	490	30·50	168
„ (Wynnstay)	Mr. Middleton	5	3 0	484 T	29·37	193
Llangollen (Plas Berwyn)	Col. Tottenham	5	0 5	440	42·86	190
d Cerrig-y-druidion	C. S. Mainwaring, Esq.	5	1 0	890 T	41·95	205
Wrexham (Pack Saddle Res.) ...	F. Storr, Esq.	5	0 9	370 T	31·02	168
„ (Cae Llwyd Res.) ...	„ „ „	8	0 9	918 T	37·35	166
„ („ „ „) ...	„ „ „	5	0 9	918 T	37·57	166
„ (Is-y-coed)	Rev. L. Wickham	8	...	106 T	26·59	148
d „ (Brymbo)	J. H. Darby, Esq.	5	...	...	36·28	161
Ruthin (Brynmair)	E. S. Currey, Esq.	5	0 10	240 B	28·81	196
d Rosset (Trevalyn Hall)	Capt. Griffith Boscawen.	5	1 0	58 T	24·42	186
d Llangerniew (Hafodunos)	H. R. Sandbach, Esq...	5	1 0	512 T	41·38	180
† Nannerch (Penbedw Hall)	Mr. W. McMurray ...	8	0 6	650 T	40·04	159
d Denbigh (Garn)	W. D. W. Griffith, Esq.	5	1 0	457 T	32·37	199
Eglwys-Bach (Bodnant)	Mr. C. Ashby	8	2 6	102 T	32·65	166
d Colwyn Bay (Nant-y-Glyn) ..	A. O. Walker, Esq. ...	5	2 3	180 T	31·66	174
„ (Bryn Euryn)	Mr. T. Hutchings	5	1 0	125 T	30·83	168
MERIONETH.						
† Dolgelly (Brithdir)	O. Hill, Esq.	5	1 6	465 T	62·27	...
d Trawsfynydd	J. Humphreys, Esq....	5	0 7	780	47·57	157
Bala (Eryl Arran)	E. Jones, Esq.	8	1 0	590 T	47·77	179
d Llanderfel (Palé Gardens)	Mr. T. Ruddy	8	1 0	606 T	40·28	227
Blaenau-Ffestiniog (Cefn-y-maes)	E. Parry Jones, Esq. ...	8	0 10	748	76·71	...
d Rhiwbrydir	Mr. R. Roberts	5	10 0	1100	79·24	166
d Corwen (Rhug Gardens)	Mr. J. Bennett	5	1 0	500	31·47	162
CARNARVON.						
*Llanystumdwy (Talarvor)	J. Roberts, Esq.	5	3 0	50	34·98	220
d†*Port Madoc	Mr. J. Roberts	5	3 0	10	47·07	160
Llandwrog (Glynllivan Park) ...	Hon. F. G. Wynn	5	1 0	80?	38·23	...
„ („ Garden) ...	„ „	5	1 0	160	40·93	226
„ („ Fort)	„ „	8	1 0	170	38·62	216
Carnarvon (Belan Fort)	„ „	5	1 0	12	30·39	...
d „ (Cocksidia)	J. Jackson, Esq.	5	1 0	120	34·68	184
„ (North Road)	W. T. Morgan, Esq. M.D.	5	1 6	60	35·24	...
d Dinorwic Quarry	Mr. J. Davies	5	4 0	850	53·61	195
d Llanbedr-y-Cennin (Llyndulyn)	T. T. Marks, Esq., C.E.	8	1 6	1622 T	92·20	162
Llanfairfechan	R. Luck, Esq.	5	0 8	150 B	33·44	176
d† Llandudno (Warwick House) ...	Dr. Nicol	8	0 8	99 T	28·42	180
ANGLESEA.						
d Llangadwaladr (Bodorgan)	Mr. J. Gray	8	3 6	...	33·05	155
Holyhead	The Meteor. Council ...	...	...	...	30·78	214
Llanerchymedd Llwydiarth Esgob	T. Prichard, Esq.	5	1 0	112 L	30·17	208

DIVISION XI.—MONMOUTH, WALES, AND THE ISLANDS—(continued.)

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain. 1889	Days on which .01 or more fell.
		Diameter	Height Above Ground.	Height Above Sea Level		
			ft. in.	feet.	inches.	
ISLE OF MAN.						
Castletown (Langness)	Bd. of Northern Lights	...	...	...	25·07	...
Derbyhaven	A. W. Moore, Esq.	5	1 0	20	25·68	133
Douglas (Derby Square)	P. Killey, Esq.	5	1 1	78	35·21	210
D „ (Victoria Road)	H. Story, Esq.	8	1 0	120 L	35·06	197
D „ (Prospect Hill)	T. Keig, Esq.	5	1 0	85	32·66	195
„ (Cronkbourne)	A. W. Moore, Esq. ...	8	0 10	138 7	36·61	197
„ (Clypse, Onchan)	„ „	8	1 0	439 7	39·39	...
Peel	„ „	5	1 0	210 7	32·08	185
The Dhoon	„ „	5	1 0	450 7	45·52	212
Ramsey	„ „	5	0 9	30	38·35	203
Andreas	„ „	5	0 6	72 7	30·35	186
Point of Ayre	Bd. of Northern Lights	...	...	...	24·44	105
ISLES OF SCILLY.						
St. Mary's	The Meteor. Council ...	8	1 6	77 L	27·83	206
D† Tresco Abbey	T. A. D. Smith, Esq. ...	12	3 0	30	29·32	196
JERSEY.						
St. Helier (Hastings Terrace) ...	W. L. Lancaster, Esq.	5	1 0	21	31·00	167
St. Aubins (Noirmont)	The Meteor. Council ...	8	1 0	270	32·24	189
GUERNSEY.						
D Les Ruettes Brayes (Le Hechat)	A. Collenette, Esq. ...	5	1 0	255 L	33·28	217
„ „ „ („ „)	„ „ „	5	1 0	255 L	33·20	...
D Villa Carey	Dr. Carey	8	1 7	180	28·63	199
„ „	„ „	5	1 7	180	29·19	...

SCOTLAND.

DIVISION XII.—SOUTHERN COUNTIES.

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which -01 or more fell.
		Diameter	Height Above Ground.	Height Above SeaLevel	1889	
WIGTON.						
Mull of Galloway	Bd. of Northern Lights	...	...	...	25·59	108
^D Garliestown (Galloway Ho.).....	Mr. J. Day.....	5	4 6	20 ?	32·18	157
Stoneykirk (Ardwell House).....	M. J. Stewart, Esq., M. P.	8	1 0	125	35·88	...
Newton Stewart (Corsbie).....	The Hon. Mrs. Stewart	...	...	...	39·36	...
Loch Ryan Lighthouse	Bd. of Northern Lights	...	...	...	37·38	114
Corsewall	„ „ „	...	3 4	22 ?	23·61	128
KIRKCUDBRIGHT.						
Little Ross	Bd. of Northern Lights	...	3 3	130 ?	24·07	...
St. Mary's Isle	Mr. Browning	5	0 4	...	35·31	...
Auchencairn (Torr House)	W. Ovens, Esq.	5	0 8	30	38·89	...
Dalbeattie (Colvend Manse).....	Rev. J. Fraser	5	1 6	120 †	34·22	...
Gatehouse (Cally)	Dr. Buchan.....	5	1 0	140	42·13	187
*Dalbeattie (Station Road).....	Mr. W. McBride	5	1 0	50	44·18	134
^D Cargen [Dumfries]	P. Dudgeon, Esq.	5	0 4	80 †	37·07	168
^D New Galloway (Glenlee)	Mr. W. Melville.....	5	1 3	208	49·61	219
Irongray (Drum Park)..... <i>old g.</i>	D. J. Kay, Esq.	3	0 8	230	46·60	...
Dalry (Dalshangan)	T. R. Bruce, Esq.	8	0 9	500	44·50	...
DUMFRIES.						
^D Ruthwell (Broadgate)	J. C. Brown, Esq.	5	1 3	70	29·79	193
^D Dumfries (Crichton Inst.).....	W. N. Smith, Esq. ...	5	0 6	159 †	32·28	169
^D „ (Ivy Bank).....	Rev. W. Andson	5	0 10	70 †	35·17	202
Canobie (Byreburnfoot).....	W. Doughty, Esq.....	3	0 8	160	37·88	...
Langholm (Westwater).....	Mr. W. Elliot.....	5	2 0	550 †	51·22	...
„	Mr. D. Elder	5	1 0	270 †	43·57	181
Moniaive (Maxwelton House) ...	Rev. Sir E. Laurie, Bt.	8	1 4	400 †	42·12	206
„ („ Garden)...	„ „ „ „	5	1 4	350 †	41·96	194
Langholm (Ewes School)	Mr. J. C. Lyall	3	1 0	445 †	38·50	...
„ („ Burnfoot)	„ „ „ „	3	1 6	541 †	45·54	...
Durrisdeer (Drumlanrig Castle)	Mr. D. Thomson.....	3	0 8	191 †	34·20	...
Moffat (Craigielands).....	J. Smith, Esq.	...	...	...	43·70	...
„ (Ericstane).....	J. J. Welsh, Esq.	3	0 6	550	41·90	...
ROXBURGH.						
New Castleton (The Flatt)	J. Elliot, Esq.	3	0 9	350 †	37·40	...
^D Hawick (Wolfelee)	Mr. Cockburn.....	5	0 6	587	31·04	162
„ (Branxholme)	W. E. Lockhart, Esq... 3	0 3	451 †	30·11	...	
*Jedburgh (Sunnyside)	G. Hilson, Esq.	5	6 0	351 †	25·87	155
St. Boswell's (Elliston).....	The Hon. G. Dalrymple	5	1 0	352	28·59	182
Kelso (Springwood Park)	Mr. W. Chaplin.....	10	1 0	130 †	28·11	154
Melrose (Asylum)	Mr. Pattman	5	0 6	480 †	29·34	205
„ (Abbey Gate)	Mr. A. B. Dodds	5	0 6	280 †	30·35	204
Wooplaw [Galashiels]	J. Murray, Esq.....	5	1 0	880 †	31·21	...

DIVISION XIII.—SOUTH EASTERN COUNTIES.

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which ·01 or more fell
		Diameter	Height Above Ground.	Height Above Sea Level	1889	
			ft. in.	feet.	inches.	
SELKIRK.						
d Selkirk (The Hangingshaw) ...	Miss Johnstone	5	0 3	670 T	32·99	182
Galashiels (Abbotsford Rd.)	Dr. Somerville	5	0 6	416 T	30·46	222
PEEBLES.						
Innerleithen (The Glen)	Dr. Buchan	...	...	...	31·87	...
Manor (Glenrath)	Mr. S. Linton	5	1 2	764 T	32·81	...
Peebles (Stobo Castle)	Dr. Buchan	...	...	600	28·67	...
Innerleithen (Runic Cross) ...	Mr. R. Mathison	5	1 6	474 T	31·08	...
„ (Leithen Lodge) ...	Mr. D. Clark	11	0 0	700 T	31·97	...
Peebles (Kailzie)	Captain W. C. Black ...	5	0 4	557 T	31·54	...
Eddlestone (Portmore Res.) ...	W. Anderson, Esq.	11	0 6	1000	32·59	168
d N. Esk Reservoir [Penicuik] ...	Mr. J. Garnock	11	0 6	1150 T	34·85	162
BERWICK.						
d Coldstream (The Hirsell)	Mr. Cairns	3	0 7	75 T	24·82	152
„ (Milne Graden)	Dr. Buchan	...	...	103	23·71	126
d Marchmont House	Mr. P. Loney	5	1 0	500 T	32·37	208
Dunse (Clouds)	C. Watson, Esq.	8	0 8	500 T	30·74	...
d „ Castle	Mr. R. Aikman	5	1 0	500	30·69	144
St. Abb's Head	Bd. of Northern Lights ...	...	0 4	211	24·01	143
HADDINGTON.						
Garvald (Donolly Reservoir) ..	Mr. G. Lumsden	11	0 2	600 T	31·20	...
d Haddington (Asylum)	J. Mowat, Esq.	5	1 0	238 T	25·94	213
East Linton	Dr. Buchan	3	0 3	90 T	24·13	...
Prestonkirk (Smeaton)	„ „	...	...	100	25·90	154
North Berwick Reservoir ...	Mr. G. Lumsden	11	0 2	150 T	22·76	...
„ „ (Fidra)	Bd. of Northern Lights ...	...	...	...	14·46	...
EDINBURGH.						
Moorfoot Hills (Bowbale)	W. Anderson, Esq.	...	...	...	41·80	...
„ „ (Gladhouse Res.)	„ „	11	0 6	900	32·24	197
„ „ (Rosebery)	„ „	11	0 6	750	29·35	139
Pentland Hills (Crosswood)	„ „	11	0 6	950	36·50	...
d Gorebridge (Middleton)	Miss Anstruther	5	0 6	750	32·30	176
Penicuik (Edgelaw Res.)	W. Anderson, Esq.	11	0 6	654	28·77	139
Pentland Hills (Harper Rig)	„ „	11	0 6	900	26·60	...
„ „ (Harehill)	„ „	11	0 6	1470	44·70	...
„ „ (Loganlea)	„ „	11	0 6	850	41·60	...
West Calder (Addiewell)	J. Fyfe, Esq.	5	0 6	600	30·46	...
Pentland Hills (Swanston)	W. Anderson, Esq.	11	0 6	550	33·30	...
„ „ (Glencorse Res.)	„ „	11	0 6	787	35·05	134
„ „ (Harlaw)	„ „	11	0 6	800	32·10	...
„ „ (Clubbiedean Res)	„ „	11	0 6	750	32·75	...
Dalkeith	Dr. Buchan	...	...	...	27·77	142
Colinton (Fernelaw)	Late J. Leslie, Esq., C.E.	11	0 6	500	27·80	...
d Dalmahoy	Dow. Countess of Morton	5	0 10	358	29·87	162
d Gilmerton Station	Mr. J. J. Bell	5	0 6	240	23·10	141

DIVISION XIII.—SOUTH EASTERN COUNTIES—(continued).

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which 40 or more fell.
		Diameter	Height Above Ground	Height Above Sea Level	1889	
EDINBURGH—(con.)			ft. in.	feet.	inches.	
Liberton (Alnwick Hill Res.) ...	J. Oliver, Esq.	...	...	400	27·13	135
Portobello (Joppa).....	R. Muirhead, Esq....	5	1 0	25 †	20·94	...
Edinburgh (Charlotte Square)...	Late J. Leslie, Esq., C.E.	11	0 6	230	22·31	...
„ („ „) ...	„ „ „ „ „ „	12	63 0	300	17·99	...
„ (Cumin Place)	Dr. Buchan.....	5	1 0	162	25·10	...
„ (Streatham Ho.).....	„ „ „ „ „ „	...	...	...	25·10	...
„ (Napier Road).....	„ „ „ „ „ „	...	...	...	23·89	...
„ (Blacket Place)	R. C. Mossman, Esq....	5	0 8	249 †	24·44	183
Leith	The Meteor. Council ...	8	1 8	22	20·02	163
„ (Navigation School)	Dr. Buchan.....	5	0 5	70	22·53	188
LINLITHGOW.						
Whitburn (Polkemmet)	Lady Baillie	...	4 0	600	39·99	...
Uphall	J. Fyfe, Esq.	5	0 9	380	25·15	...
Linlithgow (Rockville).....	Mrs. Adie	3	0 9	260	26·64	...
Bo'ness (Grange)	H. M. Cadell, Esq.....	3	1 0	20	17·70	...

DIVISION XIV.—SOUTH WESTERN COUNTIES.

LANARK.

D Douglas (Newmains).....	Mr. J. Kerr.....	3	0 4	783	46·18	205
Wiston School	Mr. W. Coore.....	3	0 6	860 †	38·10	...
D Biggar (Cambus Wallace)	Captain Paul	6	0 6	748 †	28·01	159
Carmichael House	Sir W. C. Anstruther, Bt.	6	4 6	786	26·29	...
Cleghorn	W. E. Lockhart, Esq...	3	0 3	720	27·75	...
D Dalzell House	Lord Hamilton	6	5 3	89 †	25·63	127
Hamilton Water Works	Mr. R. Watson	7	1 0	425 †	28·50	...
D " (Ardenclutha)	Rev. T. M. B. Paterson	5	1 9	260 †	28·88	156
Bothwell Castle	Mr. W. F. Archibald...	10	18 0	146 †	20·06	165
† Cambuslang (Bushy Hill).....	Dr. Muirhead.....	5	1 0	146 †	25·79	198
D Airdrie (Hillend Reservoir)	Mr. W. Ritchie	6	4 6	620 †	30·15	174
Glasgow Observatory.....	Prof. Grant, F.R.S. ...	11	1 9	182	30·56	198
" (Belvedere Hospital).....	Dr. Buchan.....	...	...	54	26·82	178

AYR.

D Ballantrae (Glendrishraig).....	P. Murdoch, Esq.	5	1 0	320	38·95	181
Barrhill (Dochroyle)	Mr. J. Scott	6	0 6	548 †	48·77	...
D Colmonell	R. Aitken, Esq.	6	0 6	100 †	40·99	184
Girvan (Pinmore)	Capt. Hamilton	5	1 0	187 †	44·40	204
Ailsa Craig.....	Bd. of Northern Lights	...	...	...	28·05	129
Loch Finlas.....	J. Wilson, Esq., C.E...	5	1 0	849 †	46·31	212
Girvan (Turnberry)	Bd. of Northern Lights	...	...	...	32·07	125
D Dalmellington (Benquhat)	A. Gillespie, Esq.	...	1 6	1128	45·47	218
Maybole (Culzean Gardens)	Mr. D. Murray	9	3 6	250	33·25	135
Ayr (Auchinlee).....	J. Drennan, Esq.	6	3 0	36 †	30·83	...
D Old Cumnock (Glaisnock).....	Mr. P. Braund	5	1 3	...	38·52	202
D " "	Mr. J. Ballantine	5	1 0	380 †	38·79	203

DIVISION XIV.—SOUTH WESTERN COUNTIES—(continued).

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which ·01 or more fell	
		Diameter	Height Above Ground	Height Above Sea Level	1889		
			ft. in.	feet.			inches.
AYR—(con.)							
Kilmarnock (North Craig)	R. Blackwood, Esq. ...	12	0 6	310	32·07	...	
Ardrossan	The Meteor. Council ...	8	1 0	10	30·71	188	
D „ (Kirkhall)	H. F. Weir, Esq.	8	2 9	106 ∇	34·19	185	
D Dalry (Carsehead)	Mrs. Aitken	5	1 1	160 $\uparrow$	43·35	203	
Paisley W. W. (Camphill)	R. Sharp, Esq.	4	1 6	611	52·10	...	
D Wemyss Bay (Ashcraig)	Miss Stewart	10	2 10	30	42·88	190	
Shaws W. Works (Kelly Dam)...	J. Wilson, Esq., C.E...	6	1 0	640 ?	51·90	...	
RENFREW.							
Lochwinnoch Castle Semple) ...	Mr. W. Thorburn	6	30 0	240	36·65	209	
Paisley Gorbals's W. Works	{ Ryat Lynn	J. M. Gale, Esq., C.E..	8	0 5	310	39·50	...
	{ Waulk Glen	„ „ „	12	0 5	280	38·30	...
	{ Middleton	„ „ „	12	0 5	550	45·05	...
	{ Nether Cairn.....	„ „ „	...	...	700	48·90	...
	{ Stanely	R. Sharp, Esq.....	12	1 0	190	32·98	...
	{ Back Thornleymuir	„ „	12	1 0	646	41·35	...
	{ Muirhead	„ „	12	1 0	482 ∇	41·55	...
	{ Springside	„ „	12	1 0	532 ∇	45·95	...
	{ Glasgow (Queen's Park)	Mr. D. McLellan	8	0 5	144 ∇	26·18	171
	{ Paisley (Ferguslie House)	Mr. Maclean	3	1 0	86 ∇	31·70	222
D „ (The Coats Observatory)	„ „ „	10	1 0	100	27·62	225	
Shaws Water Works.	{ Green Water	J. Wilson, Esq., C.E...	6	1 0	788 ∇	56·90	...
	{ Garvocks	„ „ „	6	1 0	631 ∇	54·30	...
	{ Goyfa Reservoir	„ „ „	6	1 0	640 ∇	55·20	...
	{ Mansfield	„ „ „	5	1 0	573 ∇	56·77	254
	{ Compensation Reservoir	„ „ „	6	1 0	600	52·10	...
	{ Loch Thom	„ „ „	5	1 0	643 ∇	53·63	258
	{ Shielhill	„ „ „	6	1 0	962 ∇	48·60	...
	{ Darndaff Moor.....	„ „ „	6	1 0	840	54·10	...
	{ Spango Burn	„ „ „	6	0 9	757 ∇	48·10	...
	{ Hole Glen.....	„ „ „	5	1 0	603	52·55	250
	{ New Yetts Dam	„ „ „	5	1 0	800	50·12	251
	{ Prospect Hill	„ „ „	5	1 0	200	49·53	200
	Port Glasgow (Dougliehill Res.)	„ „ „	5	1 3	549 ∇	40·75	152
	„ „ (Auchendores Res)	„ „ „	5	1 3	321 ∇	36·89	152

DIVISION XV.—WEST MIDLAND COUNTIES.

DUMBARTON.

New Kilpatrick (Chesters)	J. Kennedy, Esq.	5	1 0	240 $\uparrow$	36·46	...
D Dumbarton (Leven Shipyard) ...	Messrs. Denny, Bros... 5	1 0	21 $\uparrow$	35·12	218	
„ Helensburgh (Lyleston)	Forrest Frew, Esq..... 6	0 4	120	36·45	...	
„ „ (Rosemount) ..	L. P. Muirhead, Esq. .. 5	1 0	75	44·33	...	
„ „ (Ferniegair).....	J. R. Wilson, Esq.	...	0 6	18	41·50	197
„ „ (Water Works) ...	„ „ „ 6	0 6	300	42·72	214	
Arrochar.....	Rev. J. Dewar	5	0 9	10	57·00	...

DIVISION XV.—WEST MIDLAND COUNTIES—(continued).

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain. 1889	Days on which ".01 or more fell.
		Diameter	Height Above Ground	Height Above Sea Level		
			ft. in.	feet.	inches.	
STIRLING.						
Strathblane (Mugdock Reservoir)	J. M. Gale, Esq., C.E.	8	0 6	320	39.00	...
" (Craigend Castle) ...	Sir J. Buchanan, Bart.	5	0 9	543 †	46.10	205
Falkirk (Kerse)	A. Brown, Esq.	8	1 0	...	25.50	...
d Killearn (Old Ballikinrain) ...	Mr. J. Smith	5	0 6	265	42.54	172
St. Ninians (Woodlands)	Mr. D. Airdrie	6	4 0	100 †	25.10	...
Stirling (Polmaise Gardens)	Mr. W. W. Ritchie ...	6	1 6	12	25.60	...
d Buchlyvie (The Manse).	Rev. J. A. Macdonald..	5	1 3	118 †	39.51	224
Ben Lomond	J. M. Gale, Esq., C.E...	...	...	1800	70.80	...
BUTE.						
Arran (Pladda)	Bd. of Northern Lights	...	3 3	55 ?	35.55	137
Holy Island (Lamlash)	" " "	...	...	...	49.00	116
Rothsay (Mount Stuart)	J. Kay, Esq.	3	2 6	100 †	41.70	...
" (Barone Cottage)	" "	5	1 0	116 †	39.36	209
d " (Crichton Road)	H. Lauder, Esq.	5	4 0	97	42.55	220
ARGYLL—(MAINLAND.)						
d Holy Loch (Rosmor)	W. R. W. Smith, Esq.	5	1 1	30	59.95	193
Ardishaig	Dr. Buchan	8	0 6	14	58.64	...
d Lochgilphead (Kilmory) <i>Snowdon</i>	Sir J. Campbell Orde, Bt.	5	...	...	51.76	202
d " (Poltalloch)	Mr. J. Russell	3	4 6	121	42.39	220
d Inverary Castle	Mr. G. Taylor	5	1 0	40	63.91	235
d Oban (Craigvarren)	G. W. Brenan, Esq., C.E.	5	1 0	143	47.27	230
d " (The Corran)	Dr. Bailey	5	1 0	20	46.25	235
d Lock Etive (Ardochattan Priory).	Sir J. B. Lawes, Bt., FRS	...	1 0	...	48.57	177
Appin (Aird's)	R. Macfie, Esq.	5	0 11	41 †	46.10	..
Ballachulish	D. Campbell, Esq., M.D.	8	1 0	20	64.71	216
d Strontian (Laudale)	A. Fletcher, Esq.	8	1 0	15 †	66.40	244
d Loch Sunart (Glenborrodale) ...	J. J. Dalgleish, Esq....	5	0 2	60 †	70.99	240
Ardnamurchan	Bd. of Northern Lights	...	3 6	28 ?	28.27	149
d " (Achateny)	Mr. R. Coltart	5	0 2	61 †	55.18	224
Loch Eil (Corran)	Bd. of Northern Lights	...	0 4	14 ?	72.54	192
d " " (Conaglen)	Dow. Countess of Morton	5	0 10	36	74.30	206
ARGYLL—(INSULAR.)						
Cantire, Mull of	Bd. of Northern Lights	...	...	279 ?	25.77	149
" (Campbeltown, Devaar)	" " "	...	3 4	75 ?	36.81	140
d " (Stonefield, Tarbert) ...	Colin G. Campbell, Esq	3	1 3	90	59.26	228
d Islay (Ardbeg)	C. Hay, Esq.	5	7 0	35	36.53	188
" (Rhinns)	Bd. of Northern Lights	...	3 0	74 ?	31.69	163
" (Lochindaal)	" "	...	...	...	48.19	172
" (McArthurshead)	" "	...	...	...	43.20	128
d " (Eallabus)	J. S. R. Ballingal, Esq..	5	1 0	68 †	44.17	199
d* " (Gruinart School House) ...	Mr. D. Mac Gilp	5	1 0	214 †	44.29	214
" (Rhuvaal)	Bd. of Northern Lights	...	...	...	28.07	107
Jura (Bay of Small Isles)	H. Evans, Esq.	...	...	...	56.40	...
" (Lowlandmansbay)	Bd. of Northern Lights	...	...	...	47.46	178
" (Fladda)	" "	...	...	...	54.80	131

DIVISION XV.—WEST MIDLAND COUNTIES—(continued.)

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain	Days on which -01 or more fell.
		Diameter	Height Above Ground	Height Above Sea Level	1889	
			ft. in.	feet.	inches.	
ARGYLL—(INSULAR)—(con.)						
Jura (Ardfin)	Miss J. H. Campbell...	5	0 6	130	47·45	...
Lismore (Mousedale)	Bd. of Northern Lights	...	3 4	37 ?	33·55	152
Mull (Earraid)	" "	...	...	...	42·02	114
D " (Quinish)	J. N. Forsyth, Esq. ...	5	0 9	35	53·64	222
" (Sound of)	Bd. of Northern Lights	...	...	...	30·39	154
Tyree (Hynish)	" "	...	...	...	42·89	154

DIVISION XVI.—EAST MIDLAND COUNTIES.

CLACKMANNAN.

Tillicoultry (Tillicoultry House).	Col. A. Mitchell.....	5	1 1	200 ?	30·50	...
D Dollar	Mr. A. Blackwood	9	1 0	178	27·79	154

KINROSS.

Loch Leven Sluice	Mr. W. Clark.....	7	0 7	360 L	28·30	...
D Kinross (Turfhill).....	G. Henderson, Esq. ...	5	0 6	400 N	33·68	167

FIFE.

Inchkeith	Bd. of Northern Lights	...	...	160	19·33	...
D Dunfermline (Keavil)	L. Dalgleish, Esq.....	5	0 2	150	21·53	163
D " (Outh)	" "	5	0 2	890	24·41	129
Isle of May	Bd. of Northern Lights	...	...	...	17·52	...
Pittenweem (The Priory).....	Rev. F. K. Lloyd	5	0 10	50	26·33	...
Kilconquhar (Balcarres)	Mr. E. Tate.....	5	0 6	300 T	28·30	189
D Strathmiglo (Loden Urquhart) ..	J. Thom, Esq.	5	1 0	615 T	29·36	141
D Cupar (Fife & Kinross Asylum).	Dr. Turnbull	5	0 4	210	22·65	161
St. Andrews (Castle Cliff).....	Dr. Buchan.....	...	...	65	22·83	...
D " (Pilmour Cottage).....	Mr. R. Younger.....	5	1 0	...	23·22	169
Kilmany (Mountquhanie House).	D. Gillespie, Esq.	3	1 3	240	28·10	...

PERTH.

D Culross (West Grange)	J. J. Dalgleish, Esq. ...	5	0 2	116 N	24·58	106
" (Tulliallan F.C.Manse)...	Rev. J. W. Laurie ...	...	2 0	60	20·84	...
Blairingone [Dollar]	Rev. J. F. Cameron ...	5	1 6	300 T	32·14	...
Aberfoyle	J. M. Gale, Esq., C.E..	8	0 6	60	43·95	...
Dunblane (Kippendavie)	P. Stirling, Esq.....	3	...	362 T	26·30	...
" (Kippenross)	" " "	3	0 4	150 N	27·90	...
Sheriff Muir (Lynns Farm)	" " "	...	1 0	680	21·28	...
Loch Dhu	J. M. Gale, Esq., C.E..	8	0 6	325	62·50	...
Ledard	" " "	...	...	1500	47·15	...
Loch Drunkie.....	" " "	8	0 6	420	47·50	...
" Vennachar.....	" " "	8	0 6	275	43·65	...
D Lanrick Castle	Mr. J. Begg	3	1 0	...	36·10	135
Bridge of Turk	J. M. Gale, Esq., C.E..	8	0 6	275	48·35	...
Loch Katrine (Tunnel Hill Top)	" " "	8	0 6	830	59·60	...
Between Glen Finlas & Ben Ledi.	" " "	8	0 6	1800	38·90	...

DIVISION XVI.—EAST MIDLAND COUNTIES—(continued).

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which ·01 or more fell.
		Diameter	Height Above Ground	Height Above Sea Level	1889	
			ft. in.	feet.	inches.	
PERTH—(con.)						
Callander (The Gart).....	Late D. Ainslie, Esq....	6	0 6	...	42·74	...
„ (Leny)	J. B. Hamilton, Esq....	3	0 4	340 T	41·70	...
Glen Gyle	J. M. Gale, Esq., C.E..	...	...	380	76·30	...
D Balquhiddar (Stronvar).....	J. Dickson, Esq.	6	1 0	422 T	53·24	224
D Comrie (Dalginross)	P. McRostie, Esq.	5	0 5	200 T	39·18	209
D Crieff (Ochertyre).....	Mr. G. Croucher	3	3 0	326	28·85	189
Perth (Rosebank)	Dr. Buchan	...	...	140	27·54	191
„ (Huntingtower Field) ..	Mr. A. Bayne.....	6	1 0	40	24·30	...
D Coupar Angus Station	Mr. J. Robertson	5	1 3	183 T	25·92	183
D Dunkeld (Inver Braan).....	Rev. J. M. B. Murdoch ..	...	1 0	500 ?	32·36	129
D „ Station (H.R.S.).....	The Station Agent.....	5	1 0	212 T	36·82	124
Meikle (Arthurstone House).....	P. Carmichael, Esq. ...	5	2 3	187 T	24·54	...
„ („ Garden) ..	„ „ „ „ ..	5	2 3	196 T	25·32	...
D Dalnaspidal (H.R.S.)	The Station Agent.....	5	3 0	1414 T	50·21	247
FORFAR.						
D Dundee (Harbour).....	D. Cunningham, Esq....	5	1 0	14	27·89	201
D Broughty Ferry (Douglas Ho.)...	Mr. K. Graham	5	5 6	60 T	22·65	164
D Dundee (Eastern Necropolis) ...	W. B. McKelvie, Esq..	3	0 4	199 T	24·35	146
D „ („ „) new	„ „ „ „ ..	3	0 4	199 T	24·84	198
D „ (Camperdown Jute Works)	The Storekeeper.....	5	3 8	290	23·78	114
D Monifieth (Fountain Brae)	Messrs. Laird & Sinclair	6	1 0	55	24·14	125
D „ (Sea View)	W. Low, Esq.	8	1 0	83 T	22·05	172
D† Craigton	J. Watson, Esq., C.E.	8	1 0	481	36·29	168
† „	M „ „ „ ..	11	0 3	481	32·79	...
† Crombie Reservoir	M „ „ „ ..	11	0 3	522 T	31·54	...
† Hill Head	M „ „ „ ..	11	0 3	570 T	31·77	...
D Arbroath (Waterworks)	J. D. Watson, Esq., C.E.	5	1 0	58	20·76	151
D „ („ „) M	„ „ „ „ ..	5	1 0	58	22·54	...
D „ („ „ tower) ...	„ „ „ „ ..	5	48 0	157	14·95	134
D „ („ „)	„ „ „ „ ..	5	48 0	157	15·64	...
D „ (Cemetery)	The late Mr. J. Nicoll	5	1 3	102	23·97	163
Kirriemuir (Lednathie).....	Mr. W. Morrison	5	1 0	720	35·08	187
D „ (Lintrathen)	J. Watson, Esq., C.E.	8	1 0	700	30·40	148
„ („ „) M	„ „ „ „ ..	8	1 0	700	29·15	...
„ („ „ Creich Hill)	„ „ „ „ ..	8	1 0	1500	30·15	...
Montroseness	Bd. of Northern Lights	...	...	...	23·02	...
D Montrose (Water Works).....	J. Anderson, Esq.	6	4 0	...	25·55	...
„ („ „)	„ „ „ „ ..	12	1 0	...	25·35	...
„ (Sunnyside Asylum)...	Dr. J. C. Howden	5	0 10	200	20·11	119

DIVISION XVII.—NORTH EASTERN COUNTIES.

KINCARDINE.

The Burn [Brechin]	Col. McInroy	5	0 6	250	29·00	...
Fettercairn (Arnhall)	J. H. Hay, Esq.....	5	0 8	194	26·47	...
„	A. C. Cameron Esq. LL.D	5	0 4	237 T	28·92	173
Girdleness	Bd. of Northern Lights	...	4 7	86	15·23	110

DIVISION XVII.—NORTH EASTERN COUNTIES—(continued).

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which "01 or more fell.
		Diameter	Height Above Ground	Height Above Sea Level	1889	
			ft. in.	feet.	inches.	
ABERDEEN.						
† Braemar	J. Aitken, Esq.	8	0 9	1114 T	29·49	197
Forest of Glen Tana	Sir W. C. Brooks, Bt..	5	1 0	576 T	31·73	...
D Cromar (Logie Coldstone Manse).	Rev. Dr. Davidson.....	5	1 0	694 T	28·13	192
" (" " Loanhead).	Mr. A. Farquharson ...	5	1 0	743 T	26·06	195
" (Tillypronie).....	Mr. R. Littlejohn	5	1 0	1120 T	26·71	197
D Aberdeen (Cranford).....	D. McHardy, Esq. ...	5	1 0	120 T	28·24	216
† " (Rose Street).....	Dr. A. Cruickshank ...	5	0 5	95 T	25·60	...
" (King's College)	The Meteor. Council ...	11	2 0	48	28·07	213
" (Gordon's Hospital) ...	Dr. Buchan.....	8	1 6	66 T	28·58	220
D Midmar (Blackstock)	Mr. J. Barron.....	5	1 0	570 T	24·50	157
" (Dun Echt Observatory)	Rt. Hon. Earl Crawford	8	0 11	461 T	24·82	182
Inverurie Manse	Rev. Dr. Davidson ...	9	0 0	200	31·54	...
Ellon (Kermuck)	Mr. T. Mair	11	0 6	300 T	31·25	...
Haddo House	Mr. J. Forrest	5	0 8	197 T	30·24	...
Peterhead (Buchanness)	Bd. of Northern Lights	...	...	...	29·39	126
D New Deer (Artamford Cottage)..	J. Joiner, Esq.....	5	1 0	551 T	34·81	272
D Old Deer.....	J. Walker, Esq.....	5	2 0	135 T	30·18	234
Kinnairdhead.....	Bd. of Northern Lights	...	...	...	24·81	140
BANFF.						
D Keith (H.R.S.)	The Station Agent.....	5	1 0	364 T	28·58	185
Banff (St. Leonard's).....	A. Ramsay, Esq.	5	1 0	115 T	26·08	228
D Boyndie (Whitehills)	Rev. W. Anderson ...	5	1 0	68 T	24·98	214
Cullen House	Mr. J. F. Smith.....	5	0 9	100 T	27·91	...
ELGIN OR MORAY.						
Grantown	Mr. W. Duncan.....	5	1 1	712 T	27·32	177
Craigellachie(WesterElchiesSch)	Mr. J. Milne	8	1 0	560 T	26·52	163
D Forres (H.R.S.)	The Station Agent.....	5	1 0	25	19·80	158
" (Grange Hall)	J. Grant Peterkin, Esq.	5	1 2	50 T	20·05	...
Gordon Castle.....	The late Mr. Webster..	8	1 6	104 T	26·62	...
D Elgin (Highfield)	A. Cameron, Esq.	5	0 11	80 T	23·14	196
NAIRN.						
Dunearn Lodge [Dava].....	Dr. Buchan.....	...	...	..	25·35	...
Nairn (School Ho.)	The Meteor. Council ...	8	1 9	84	19·30	191

DIVISION XVIII.—NORTH WESTERN COUNTIES.

WEST ROSS.‡

d Strome Ferry (H.R.S.)	The Station Agent.....	5	1 0	40 T	51·83	227
Applecross Gardens	Mr. D. McCowan	5	1 0	70 T	46·41	...
Strathconan [Beauly]	Mr. D. McIver	5	1 0	450	39·67	131
d Glencarron Lodge	D. D. Munro, Esq.....	5	1 0	504	79·71	260
Loch Torridon (Bendamph)	Rt. Hon. Earl Lovelace	5	1 0	36	70·56	...

‡ Including Cromarty.

DIVISION XVIII.—NORTH WESTERN COUNTIES—(continued.)

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which .01 or more fell.
		Diameter	Height above Ground.	Height above Sea Level	1889	
WEST ROSS—(con.)						
Loch Vraon.....	Sir J. Fowler, Bt.	8	0 7	750	61·43	...
Lochbroom (Loch Drome).....	„ „ „	8	7 0	850	61·51	...
Braemore House.....	„ „ „	8	0 7	750	52·11	...
„ Lodge.....	„ „ „	8	0 7	100	48·24	...
d Lochbroom	Mr. M. Macleay.	5	0 6	48	43·77	203
Isle of Lewis (Stornoway)	Bd. of Northern Lights	...	3 4	31 ?	27·33	180
„ „ „	The Meteor. Council....	8	1 0	24	44·49	278
„ (Butt of Lewis) ...	Bd. of Northern Lights	...	3 6	...	27·19	...
EAST ROSS.‡						
Achonachie Lodge [Beaully].....	W. C. Preston, Esq. ...	5	1 0	125 B	29·80	223
Strathpeffer Spa.....	Dr. Fox	5	0 10	200	28·34	154
d Dingwall H.R.S.	The Station Agent ...	5	3 0	15	14·51	124
Cromarty	Bd. of Northern Lights	...	...	...	11·83	136
d Alness (Ardross Castle).....	Mr. R. Massie.....	5	1 0	450 A	30·93	208
Fearn (Arboll)	Miss Hope-Douglas ...	5	1 2	65	17·87	...
d „ (Lower Pitkerrie)	R. Gordon, Esq., C.E..	5	1 0	90	19·49	139
Tarbetness	Bd. of Northern Lights	...	3 4	61 ?	24·26	118
WEST INVERNESS.						
Ben Nevis Observatory.....	Dr. Buchan.....	5	...	4407	120·71	...
d Fort William (Public School) ...	C. Livingstone, Esq. ...	5	1 0	36 A	64·98	246
Moidart (Roshven)	Prof. Blackburn	5	1 0	68 A	60·55	245
d Loch Shiel (Glenaladale)	Major Macdonald	5	1 2	50 ?	87·11	263
d Borrodale (Arisaig)	Mr. A. Grant.....	5	1 0	20	58·30	267
Glenquoich	Dr. Buchan.....	8	2 0	660	88·26	...
Isle of Skye (Oronsay)	Bd. of Northern Lights	...	0 6	15 ?	54·39	187
„ „ (Kyle Akin)	„ „ „	...	0 2	3 ?	58·20	142
Rona	„ „ „	...	...	...	30·00	125
Barra (Barrahead).....	„ „ „	...	3 0	640 ?	26·44	145
S. Uist (Ushenish).....	„ „ „	...	0 4	157 ?	81·80	161
N. Uist (Monach)	„ „ „	...	...	...	40·99	129
d „ (Loch Maddy)	Mr. G. McKay	5	1 0	...	41·68	...
Harris (Island Glass)	Bd. of Northern Lights	...	3 4	50 ?	34·89	143
EAST INVERNESS.						
d Invergarry	Mrs. Ellice	5	1 0	...	45·11	...
d Fort Augustus	Rev. E. G. Cody	5	1 6	68	32·67	206
d Aviemore (H.R.S.).....	The Station Agent.....	5	1 0	710	24·50	207
d Loch Ness (Drumnadrochit).....	Mr. A. Grant.....	5	1 0	104	27·31	202
Inverness (H.R.S.)	The Station Agent.....	5	1 8	...	17·36	...
† „ (Culloden House)....	D. Forbes, Esq.	6	4 0	104 I	18·72	...
d Cawdor [Nairn]	J. Joss, Esq.	5	1 0	250 I	23·96	196

‡ Including Cromarty.

DIVISION XIX.—NORTHERN COUNTIES.

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which ·01 or more fell.
		Diameter	Height Above Ground	Height Above Sea Level	1889	
SUTHERLAND.						
Invershin	Mr. G. Young	5	4 0	20 †	25·05	...
D Golspie (H.R.S.)	The Station Agent	5	0 9	27	29·68	119
D „ (Dunrobin Castle)	Mr. D. Melville	5	1 0	14 †	27·69	140
„ („ „)	„ „ „	3	0 3	13 †	28·18	...
Lairg	Mr. J. Young	5	3 0	335	28·55	217
D „ (H.R.S.)	The Station Agent	5	...	...	25·99	159
Assynt (Achumore)	J. Elliot, Esq.	3	0 9	200 †	68·40	...
Stourhead	Bd. of Northern Lights	...	...	...	40 90	175
Scourie	J. Simpson, Esq.	5	0 4	28	38·91	...
Cape Wrath	Bd. of Northern Lights	3	3 6	355 ?	27·75	127
CAITHNESS.						
Wick	The Meteor. Council ...	8	1 9	77	31·72	251
D† „ (H.R.S.)	The Station Agent	5	1 0	...	30·69	115
† „ (Nosshead)	Bd. of Northern Lights	8	4 8	127 ?	29·42	160
D† Watten (H.R.S.)	The Station Agent	5	2 6	75 †	24·83	215
Thurso (Holburnhead)	Bd. of Northern Lights	3	0 8	60 ?	30·20	133
Dunnethead	„ „ „	...	3 0	...	31·67	144
Pentland Skerries	„ „ „	...	3 3	72 ?	23·23	191
ORKNEY.						
D South Ronaldshay (Roeberry) ...	J. Gray, Esq.	5	1 2	101 †	29·89	220
Hoy (Cantickhead)	Bd. of Northern Lights	...	0 6	...	49·90	146
„ (Graemsay Sound, East=High)	„ „ „	...	3 4	27 ?	32·99	142
„ („ „ „ West=Low)	„ „ „	...	3 4	...	31·83	223
Pomona (Swanbister)	The Meteor. Council ...	8	1 0	69 †	35·62	252
„ (Kirkwall)	Mr. J. W. Cursiter ...	5	0 6	30	35·12	233
Shapinsay (Balfour Castle)	Mrs. Balfour	4	0 6	50	31·30	...
Sanda (Start Point)	Bd. of Northern Lights	11	0 6	29 ?	27·13	...
North Ronaldshay	„ „ „	...	3 4	21 ?	23·72	...
SHETLAND.						
Sumburghhead	Bd. of Northern Lights	...	...	...	30·22	132
„ (Dunroseness) ...	The Meteor. Council ...	8	1 0	84	35·73	235
Bressay Lighthouse	Bd. of Northern Lights	5	0 4	60	44·27	166

IRELAND.

DIVISION XX.—MUNSTER.

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which 50 or more fell.	
		Diameter	Height above Ground.		Height above Sea Level		1889
			ft.	in.	feet.	inches.	
CORK.							
D Dunmanway (Coolkelure)	Col. Shulldham	5	2	0	500 T	59·89	224
Roche's Point.....	The Meteor. Council ...	8	1	9	32	43·86	196
Carrigaline (Ravenswood).....	Miss Westropp	5	1	0	130 L	40·09	...
D Cork (Blackrock)	J. B. Binyon, Esq. ...	8	5	0	30 T	35·18	166
D „ (Clarence Place)	W. Miller, Esq.....	5	3	6	109 A	31·61	179
„ (Park View).....	R. C. Sikes, Esq.	5	1	0	123 B	35·12	...
D Fermoy (Gas Works).....	Mr. J. Grant	5	1	1	...	33·29	171
Ballyhooly (Wood Cottage) ...	R. H. Wake, Esq., M.D.	5	1	3	195 A	41·25	...
KERRY.							
Kenmare (Derreen)	Mr. W. Holbrow	5	1	0	74 T	61·85	177
„ (Inishfea)	R. J. Mahony, Esq....	5	0	4	150	54·67	...
D Dromore Castle	„ „ „	5	0	6	50 L	54·17	200
Valencia (Telegraph Station) ...	The Meteor. Council ...	8	1	0	12	55·95	254
Mangerton	VenArchdeacon Wynne	8	0	8	1760 B	96·00	...
D Killarney (Woodlawn)	„ „ „	5	1	0	96 A	50·05	218
„ (Asylum)	„ „ „	5	0	10	180 T	49·89	...
Dingle.....	Rev. J. B. Anderson ...	5	1	0	10 P	60·22	...
Ballyheigue	VenArchdeacon Wynne	5	1	0	60	38·03	...
WATERFORD.							
Knockaderry	M. J. Fleming, Esq. C.E.	5	0	8	230 T	36·55	215
D Waterford (Brook Lodge).....	C. P. Bolton, Esq., C.E.	5	1	0	100 T	32·05	191
„ (Ticor)	M. J. Fleming, Esq. C.E.	5	0	8	171 T	31·68	166
D Portlaw (Mayfield).....	J. Anderson, Esq.	5	4	0	70	35·35	173
D Glenam [Clonmel]	Miss Grubb.....	8	1	4	80 T	35·60	199
TIPPERARY.							
D Tipperary (Henry Street).....	J. Dowling, Esq., M.D.	5	1	0	400 P	33·99	209
D Fethard (Mobarnane)	Dr. Donaldson	5	1	1	370	32·21	173
D Derrycastle [Killaloe] ...	Mr. T. Manly.....	5	1	6	580 T	42·22	219
Nenagh (The Lodge)	Heber Koe, Esq.	5	1	0	100	28·02	...
D „ (Clashnevin).....	J. Mounsey, Esq.	5	1	2	300 A	28·34	185
D Ballingarry (Hazelfort)	Mrs. Fraser.....	5	1	0	...	31·83	200
LIMERICK.							
Jane Ville [Tipperary].....	R. Harding, Esq.	5	1	0	366	40·05	...
Foynes	The Meteor. Council ...	...	...	...	...	35·57	212
Limerick (Roxborough).....	A. W. Shaw, Esq.....	8	1	6	112 T	35·30	173
„ (Kilcornan)	Mr. J. Smyth.....	5	1	0	...	27·30	...

DIVISION XX.—MUNSTER—(continued).

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain. 1889	Days on which ·01 or more fell.
		Diameter	Height Above Ground	Height Above Sea Level		
			ft. in.	feet.	inches.	
CLARE.						
D O'Briensbridge (Ross)	J. Digan, Esq.	10	2 0	93	34·61	198
D Sixmilebridge (Kilkishen)	Rev. Canon Lloyd	5	4 4	113 $\nearrow$	33·49	203
D Broadford (Hurdlestown).....	Capt. Bentley.....	5	1 0	164	31·59	229
D Ennis	J. Hill, Esq., C.E.....	10	3 2	21 $\downarrow$	38·88	180
„ (Roslevan)	Mrs. Scott	5	1 9	...	35·95	201
D Miltown Malbay	M. Molohan, Esq.	5	1 0	400 $\uparrow$	44·23	237

DIVISION XXI.—LEINSTER.

WEXFORD.

D New Ross (Longraigue).....	J. W. Deane, Esq.....	5	1 0	210 $\uparrow$	32·29	173
D Wexford (Alma)	E. M. Ryan, Esq.	5	1 6	50 $\nearrow$	31·76	159
D „ (Felt House)	W. Charlton, Esq.....	5	3 3	0	27·02	134
D Enniscorthy (Ballyhyland)	J. Moffat, Esq.	5	1 0	365 $\uparrow$	33·30	200
D Gorey (Courtown House)	RtHonEarlofCourtown	5	3 0	80 $\uparrow$	29·72	176

KILKENNY.

Rosbercon Castle [New Ross] ...	A. E. Graves, Esq. ...	10	2 6	60	26·62	137
D Inistioge (Woodstock)	Lady Louisa Tighe ...	5	4 6	400 $\uparrow$	36·76	172
Graigie (Brandondale).....	R. R. Burtchaell, Esq.	5	2 0	90 $\uparrow$	35·76	122
Kilkenny (Lavistown)	D. A. Milward, Esq....	5	1 0	180 $\uparrow$	26·39	173
„ Castle.....	The Meteor. Council ...	8	...	...	30·26	183

WICKLOW.

Greystones (Knockeevin)	Miss Alice Price.....	5	0 8	40	31·26	132
D Enniskerry (Parknasilloge)	Dr. Barrington	10	4 0	450	46·81	200
D† Bray (Fassaroe)	R. M. Barrington, Esq.	10	5 0	250	40·54	178

CARLOW.

D Bagnalstown (Fenagh House) ...	D. R. P. Beresford, Esq	5	1 0	340	35·06	147
D Carlow (Browne's Hill).....	R. C. Browne, Esq.	5	1 0	291 $\nearrow$	31·21	213

QUEEN'S COUNTY.

Abbey Leix (Blandsfort)	J. L. Bland, Esq.	8	3 0	532 $\nearrow$	31·26	205
-------------------------------	------------------------	---	-----	----------------	-------	-----

KING'S COUNTY.

Parsonstown (Birr Castle)	The Meteor. Council ...	8	0 11	180	27·03	214
„ („ „)	RtHonEarlofRosseFRS	8	0 7	183	27·08	214

KILDARE.

D Straffan House	Mr. F. Bedford	5	2 0	240	28·37	175
------------------------	----------------------	---	-----	-----	-------	-----

DUBLIN.

D Glensmoel Lodge	C. E. Atkinson, Esq., CE	5	1 6	800 $\uparrow$	48·76	250
D „ (Rathmines W.W.)...	„ „ „ „ „ „ „ „ „	5	1 6	581 $\nearrow$	41·63	218
D Carrickmines (Claremount)	C. Joynt, Esq., M.D....	5	1 2	270	30·10	184
D Killiney (Cloneevin)	R. O'B. Furlong, Esq..	5	1 0	250 $\uparrow$	24·22	167

DIVISION XXI.—LEINSTER—(continued).

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which 40 or more fell.
		Diameter	Height Above Ground	Height Above Sea Level	1889	
DUBLIN—(con).						
D Killiney (Eirine) ...	Rev. H. Palmer.....	5	1 0	50	25·87	184
D† Dublin (Fitz William Square) ...	J. W. Moore, Esq., M.D.	5	3 4	54 †	27·27	193
„ (Upper Leeson Street) ...	G. D. Powell, Esq., M.D.	5	0 6	49 †	26·97	173
D „ (Phoenix Park).....	Major Kirkwood, R.E..	8	1 0	162 †	26·93	241
Glasnevin (Botanic Gardens) ...	F. W. Moore, Esq. ...	8	0 11	62 †	25·47	163
D Balbriggan (Laragh).....	Rev. S. P. Warren	5	1 0	57 †	26·59	210
MEATH.						
D Trim	P. Malone, Esq., C.E.	10	4 2	180 †	28·71	150
Athboy	J. Penrose, Esq.....	8	1 3	227	28·07	153
Moynalty (Westland)	W. A. Barnes, Esq. ...	5	1 4	265	35·91	199
WESTMEATH.						
D Mullingar (Belvedere)	Mr. J. Bayliss	5	1 0	367 †	32·78	178
D Athlone (Twyford)	J. Hodson, Esq.....	5	5 0	188 †	33·04	223
LOUTH.						
D Ardee (Lissrenny)	T. F. Filgate, Esq.....	8	0 10	75 †	36·49	212
D Louth (Stephenstown)	Col. Fortescue	5	0 11	75 †	34·40	200
D Dundalk (Farndreg)	J. Barton, Esq.	5	1 0	90 †	34·63	157
D Ravensdale (Anaverna)	Miss Stephen	8	1 9	255 †	41·77	213
D „ School	Mr. Locke	8	1 6	200	46·62	211
D Greenore	T. Chambers, Esq.....	5	1 0	4 †	31·41	136
LONGFORD.						
D Edgeworthstown (Currygrane Ho)	J. M. Wilson, Esq.....	5	1 0	265 †	33·94	241

DIVISION XXII.—CONNAUGHT.

GALWAY.						
d Galway (Queen's College).....	Prof. Anderson	5	1 0	22	36·87	236
d Ballinasloe	W. H. Kempster, Esq.	5	0 6	150 †	31·90	222
d „ (Garbally)	Mr. J. Cobban	8	1 0	157 †	36·19	230
d Woodlawn	Mr. A. Porter.....	5	3 6	300 †	37·82	223
d Ahascragh (Clonbrock)	Rt. Hon. Lord Clonbrock	10	5 6	200 †	35·73	144
d Clifden (Kylemore House)	Mr. T. McNab	5	1 0	105	71·53	239
d „ („ Castle)	Mr. W. Farmer.....	5	0 9	...	73·36	210
Tuam (Gardenfield)	M. H. Kirwan, Esq.	5	1 0	155 †	40·71	...
„ („) ... Snowdon	„ „ „	5	6 0	160 †	40·27	...
ROSCOMMON.						
d Donamon (Castlecoote)	Mr. A. Chute	5	0 10	197 †	36·22	220
MAYO.						
Ballinrobe (Cranmore) ...	Miss Knox	5	0 9	...	44·68	...
„ (Kilrush)	J. Simson, Esq.	5	1 0	120 †	39·07	...

DIVISION XXII.—CONNAUGHT—(continued.)

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which ".01 or more fell
		Diameter	Height Above Ground	Height Above Sea Level	1889	
			ft. in.	feet.	inches.	
MAYO—(con.)						
Westport (Oldhead House)	H. Wilbraham, Esq....	3	1 7	100 †	53·50	...
d Crossmolina (Enniscoe)	J. Pratt, Esq.....	5	0 11	74 †	46·58	247
Belmullet	The Meteor. Council ...	8	...	...	49·27	267
SLIGO.						
d Collooney (Markree Observatory)	A. Marth, Esq.	5	1 0	130 †	43·50	248
(" " " ")	" " " " " " " "	5	16 6	148 †	38·06	242
d Sligo (Mount Shannon) "	F. M. Olpherts, Esq....	5	4 5	70 †	41·98	208
Mullaghmore	The Meteor. Council ...	8	1 2	40	43·28	250
LEITRIM.						
d Ballinamore (Lawderdale)	J. O. Lawder, Esq. ...	5	1 0	275 †	39·90	228

DIVISION XXIII.—ULSTER.

CAVAN.						
d Lough Sheelin (Arley)	Major S. H. Maxwell...	8	2 0	230 †	36·70	212
d Belturbet (Red Hills)	Rev. E. B.W. Venables	5	0 9	208 †	35·16	224
FERMANAGH.						
Enniskillen (Florence Court) ...	The Earl of Enniskillen	8	1 9	250 †	37·49	195
Brookboro' (Colebrook Park) ...	The Meteor. Council ...	...	1 0	279	40·48	206
ARMAGH.						
d Edward St. Station [Newry] ...	J. L. D. Meares, Esq...	5	1 0	22 †	41·03	136
d Armagh Observatory	Dr. Dreyer	8	1 0	205 †	30·64	208
d Lurgan (Belle Vue)	F. W. Bell, Esq.	5	0 4	200 †	32·06	194
DOWN.						
d Warrenpoint (Summer Hill).....	Mr. B. M. Kernan	5	1 0	30 †	37·27	134
Newcastle (Fairleigh)	Rev. J. H. Seymour ...	5	1 2	12	49·35	193
d Rathfryland (Ballynagappoge)...	J. Smyth, Esq., C.E....	5	3 0	300	35·77	142
Castlewellan (Lough Island) ...	" " " " " " " "	10	3 0	442 †	44·70	...
Banbridge (Katesbridge)	A. " Mulligan, Esq.	5	1 0	230	30·69	...
d Seaforde	Col. Forde	8	0 5	180 †	36·34	216
Banbridge (Corbet Reservoir) ...	J. Smyth, Esq., C.E....	10	3 0	234 †	28·20	...
d† " (Milltown)	" " " " " " " "	8	0 8	200 †	34·05	205
d† Waringstown	Col. Waring, "M.P." ...	8	0 8	191 †	35·50	212
d Sydenham (Alma House)	R. Reade, Esq.	5	1 0	60	32·77	173
Hollywood Waterworks	L.L. Macassey, Esq., CE	5	1 4	310 †	29·60	131
Donaghadee	The Meteor. Council ...	8	1 6	30	30·80	229
ANTRIM.						
Lisburn	W. H. Dawson, Esq....	5	1 6	208	41·86	...
Aghalee [Lurgan]	F. L. Turtle, Esq.....	5	1 0	105 †	24·36	129
Stonyford (Belfast W. W.)	L.L. Macassey, Esq., CE	5	0 7	470 †	38·31	180
" (" " ") ... M	" " " " " " " "	5	0 7	470 †	38·36	...

DIVISION XXIII.—ULSTER—(continued).

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain. 1889	Days on which ·01 or more fell.
		Diameter	Height Above Ground	Height Above Sea Level		
			ft. in.	feet.	inches.	
ANTRIM—(con.)						
† Belfast (Queen's College)	Mr. W. Taylor	11	7 4	68 ∇	31·20	188
D „ (New Barnsley)	J. Firth, Esq.	5	1 0	200 $\uparrow$	40·87	222
† „ (Antrim Road)	G. Thompson, Esq. ...	7	7 0	144 $\uparrow$	36·40	224
„ (Divis Mountain) ...side	L. M. Ewart, Esq.	8	1 0	1350 ∇	40·00	...
† Antrim (The Manse)	Rev. Dr. Orr	5	1 0	150 ∇	30·62	156
Carrickfergus (South Woodburn)	G. E. Reilly, Esq.	5	1 0	640 ∇	40·36	280
D „ (North Woodburn)	„ „	5	1 0	735 ∇	44·08	278
„ (Copeland)	„ „	5	1 0	42+ ∇	35·40	256
„ (Lough Mourne)...	„ „	5	1 0	596 ∇	38·80	267
D Ballyclare	J. Sutherland, Esq. ...	6	1 0	210 $\uparrow$	34·21	205
D Ballynure (Ballyboley)	Mr. T. H. Craig	5	1 2	400	40·21	180
D Ballymena (Harryville)	A. Dawson, Esq.	5	1 0	150 $\uparrow$	40·45	248
D Broughshane (Quolie)	J. Lanyon, Esq.	...	1 0	...	41·77	245
D Stranocum (Gardenvale)	A. McNeill, Esq.	5	1 0	150	45·67	221
D Bushmills (Dundarave)	Sir F. E. Macnaghten, Bt	5	1 0	162 $\uparrow$	38·90	228
LONDONDERRY.						
D Garvagh (Moneydig)	Miss Morrison	5	1 0	121	38·91	200
Londonderry (Knockan)	Rev. H. F. Stevenson..	5	1 0	300	44·49	241
„ (Clooney Terrace)..	The Meteor. Council ...	5	1 0	75	39·83	227
D „ (Creggan Res.)	Mr. J. Hutchinson	8	1 0	320 $\uparrow$	43·48	250
D Limavady	C. D. H. Campbell, Esq.	5	4 0	81 $\uparrow$	33·62	230
D „ (Drenagh)	C. T. McCausland, Esq.	5	1 0	80	37·93	235
Bellarena	Sir F. W. Heygate, Bt.	5	3 0	12 $\uparrow$	39·93	197
D Coleraine	J. Kennedy, Esq.	5	4 0	52 $\uparrow$	40·00	197
TYRONE.						
Moy (Derrygally)	W. M. Bond, Esq.	10	6 0	45	33·46	...
„ („)	„ „ „	5	6 0	45	37·39	152
D Stewartstown (The Square)	A. Johnston, Esq.	5	1 4	300 $\uparrow$	35·20	189
D Dungannon (Rockdale)	Col. Lowry	5	1 0	300 $\uparrow$	34·51	205
„ („)	„ „	5	1 0	270 $\uparrow$	35·77	...
D Stewartstown (Ardree Rectory)	Ven. Archd. Meade....	5	1 0	191 $\uparrow$	36·32	203
D Omagh (Edenfel)	Col. Buchanan	8	1 0	280 $\uparrow$	37·15	236
DONEGAL.						
Killybegs	A. Brooke, Esq.	5	1 0	30	64·53	245
Castlefinn (Finn Lodge)	Sir F. W. Heygate, Bt.	5	1 0	50	34·96	174
Raphoe (Convoy Ho.)	Col. Montgomery	5	1 0	110 $\uparrow$	44·49	221
D Letterkenny (Carrablagh)	H. C. Hart, Esq.	5	1 0	130	48·15	260
Bloody Foreland (Ardnadreen)...	Rev. W. S. Griffith ...	5	0 9	39 $\uparrow$	41·75	...
D Buncrana (Rockfort)	T. Colquhoun, Esq. ...	5	1 0	40 $\uparrow$	41·40	241
D Moville (Prospect Villa)	Mr. J. Lowry	8	1 6	78 $\downarrow$	34·54	241
D „ (The Rectory)	Rev. S. R. Craig	5	1 0	110 ∇	43·45	223
Malin Head	The Meteor. Council ...	8	...	...	34·29	232

ARRANGEMENTS
FOR THE
SYSTEMATIC OBSERVATION
AND
RECORD
OF THE
RAINFALL OF THE BRITISH ISLES.

COMPILED BY

G. J. SYMONS, F.R.S.,

*Secretary Royal Meteorological Society ; Membre du Conseil Société Météorologique de France ;
Member Scottish Meteorological Society ; Korrespondirendes Mitglied Deutsche
Meteorologische Gesellschaft ; Member of Council Royal Botanic Society ;
Registrar and Member of Council Sanitary Institute ; Fellow Royal
Colonial Institute ; Membre correspondant étranger Soc. Royale de
Médecine Publique de Belgique ; Hon. Mem. Hertfordshire Nat.
Hist. Soc., Essex Field Club ; Northamptonshire Nat. Hist.
Soc., Croydon Microscopic Soc., &c., &c., &c.*

SEVENTH EDITION.

LONDON :
EDWARD STANFORD, COCKSPUR STREFT, S.W.
1890.

Introductory and Historical.—I cannot help this section appearing to be egotistical ; the rainfall organization being entirely my own creation, it is impossible for it to be otherwise.

In the early part of the year 1859 I began collecting copies of records of the fall of rain, and early in 1861 wrote to all the observers of whom I was then aware, and asked them to send me all the records for the year 1860 that they could. I received 168 returns, and printed a table showing the total fall at all those places, being a larger number than had ever been classed together before. This publication gave a stimulus to observers, and from that time onwards their number has steadily increased until it is now nearly 3,000.

The amount of information published has increased even more, for whereas at first I printed only the total annual fall, I now publish essays on various branches of rainfall enquiry, and full abstracts of the most remarkable falls in short periods (ten minutes, half-an-hour, and so on), the heaviest falls in one day, tables of the monthly fall at several hundred stations, and, in short, give all the information which I can collect and which it seems expedient to print.

From the foregoing it will be evident that the compilation of the present annual volume (of which the short title is “British Rainfall, 1889,” &c.) is a very serious labour. The mere checking of more than two thousand returns takes a long time, and so does the due arrangement of the various facts reported, and by no means the least onerous matter is ensuring the accuracy of the printing of the whole.

During the first few years I not only gave my own time gratuitously to the work, but also bore all the cost of postages and of printing. It soon, however, became far too great for me to bear, and my correspondents most kindly offered to share it with me. In 1865 the price of the annual volume was fixed at five shillings, and, although the size and cost of the volume has since so largely increased, that the price to the general public has had to be doubled, those observers who desire it are still allowed one copy at the old price. There are two reasons for this : (1) Because as the book could not be compiled without the help of observers, they ought to be allowed to have it as cheaply as possible ; (2) Because a small number of the observers (about 300, whose subscriptions are duly published) contribute annual sums varying from one to ten guineas towards the general expenses of the work.

The existing state of matters is, therefore, shortly as follows. There

are nearly 3000 persons, well spread over England and Wales, Scotland and Ireland, each of whom is, I hope, strictly obeying the rules on page 5. To each of them I send on December 31st each year, blank forms for them to return to me filled with the facts observed by them. At the same time I send a list of the various publications, and invite such pecuniary aid as it may be agreeable to them to send.

I ought, perhaps, to say what becomes of the subscriptions. I will mention some of the outlets. (1) There are nearly a thousand observers whose returns have to be collected, examined, discussed, and printed, who do not contribute sixpence towards the cost thereof. (2) In some localities it is impossible to obtain volunteer observers, and there the observers receive regular salaries. (3) The mass of office work, correspondence, &c., is far beyond what I can myself accomplish; two regular assistants are, therefore, employed, and besides that, considerable sums are paid for extra assistance at times of pressure. (4) The expenditure for printing and postages is very large.

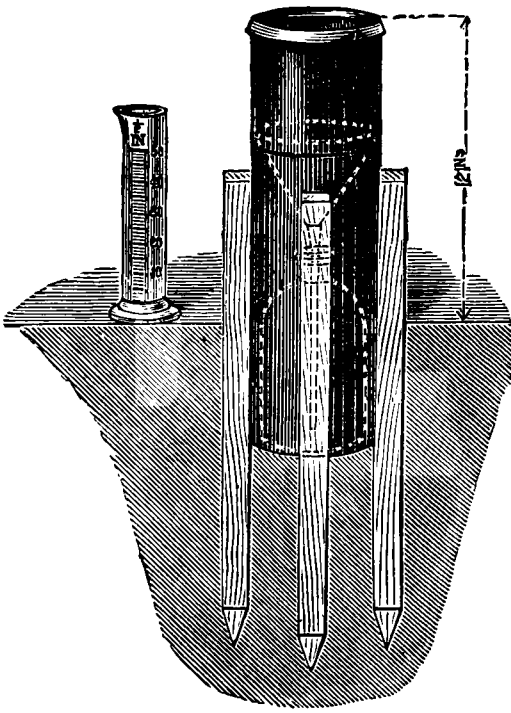
In addition to the annual volume, I publish a monthly periodical, *Symons's Monthly Meteorological Magazine*, giving, in addition to a full chronicle of the progress of meteorology, details of rainfall at about 100 stations. This is sent free to subscribers.

It may, perhaps, be added that it always affords me pleasure to reciprocate as far as possible the assistance which the observers render to me, either by affording them meteorological information, data as to the height of their stations above sea level, or advice as to the purchase of instruments.

In short, the state of the case is this: I have given myself up to the collection of statistics of rainfall—old ones and current ones; I invite everybody to help me, both with observations and with funds, and I promise, in return, to render to all my correspondents all the help that is in my power.

Patterns of Rain Gauges, and where to Buy them.—This is not a pleasant section to write, for there is considerable jealousy among the manufacturers, and I am almost certain to be accused of favouritism by some one. However, I have never patented any pattern of rain gauge, and therefore leave the field open to all.

Upon one point it is necessary to be despotic, viz., that amateurs never try to make their own gauges; they are almost certain to go wrong in some respect, and nothing is more vexing, both to the observers and to myself, than for it to be discovered after observations have been recorded for a long time that the labour of years is vitiated by an inaccurate instrument.



For use in ordinary localities I think that the annexed is the best pattern ; it is known as the Snowdon gauge ; it is five inches in diameter, is easily fixed by four stakes, as shown ; the glass jar, each division on which denotes $\frac{1}{100}$ th of an inch of rain, when filled up to the top division holds 0·50 in., or half an inch ; the bottle holds about three inches of rain, and, of course, in the very rare case of the fall exceeding that, the excess is saved by the can, and must be carefully measured. They cost from 10s. 6d. to £1 ls., according as they are made of japanned tin, of galvanized iron, or of copper. Where cost is no object, it is, by some, thought better to have a

rather larger gauge, viz., eight inches diameter, costing from £2 to £3, but I do not advise it.

Snowdon pattern rain gauges can, no doubt, be obtained from any optician, but it may be convenient to give, in alphabetical order, the names and addresses of a few of the principal makers :—

CASELLA, L., 147, Holborn, E.C.

HICKS, J. J., Hatton Garden, E.C.

NEGRETTI & ZAMBRA, Holborn Viaduct and Cornhill, E.C.

PASTORELLI, F., 10, New Bond Street, W.

Testing.—Wherever, and of whomsoever, rain-gauges may be bought it is very desirable that the purchaser should insist upon having certificates of their accuracy. Rain gauges are examined, and certificates issued, by Kew Observatory, and by myself, the charge in each case is the same, namely, 2s. 6d.

Blank Forms.—All blank forms required for returns to myself, and additional ones wherever desired, are supplied gratuitously, and even those sold are charged at little more than their actual cost.

Change of Residence.—Each observer is requested to decide upon a specific name for his station, and to notify immediately any change in the position of the gauge or the discontinuance of his record.

SUGGESTIONS FOR SECURING UNIFORMITY OF PRACTICE AMONG RAINFALL OBSERVERS.

I.—SITE.—A rain gauge should not be set on a roof, a slope, or a terrace, but on a level piece of ground, at a distance from shrubs, trees, walls, and buildings—at the very least, as many feet from their base as they are in height. Tall-growing flowers, vegetables, and bushes must be kept away from the gauge. If a thoroughly clear site cannot be obtained, shelter is most endurable from N.W., N., and E., less so from S., S.E., and W., and not at all from S.W. or N.E.

II.—OLD GAUGES.—Old established gauges should not be moved, nor their registration discontinued until, at least, two years after a new one has been in operation, otherwise the continuity of the register will be irreparably destroyed. Both the old and the new ones must be registered at the same time, and the results recorded for comparison.

III.—LEVEL AND FIXING.—The funnel of a rain gauge must be set quite level, and the gauge so firmly fixed that it will remain so in spite of any gale of wind or ordinary circumstance. Its correctness in this respect should be tested from time to time.

IV.—HEIGHT.—The funnels of gauges newly placed should be 1 ft. above grass. Information respecting height above sea level may be obtained from the Editor.

V.—RUST.—If the funnel of a japanned gauge becomes so oxidised as to retain the rain in its pores, or threatens to become rusty, it should have a coat of gas tar, or japan black. Copper gauges are free from this evil, and far the best.

VI.—FLOAT GAUGES.—If the measuring rod is detached from the float, it should never be left in the gauge. If it is attached to the float, it should be pegged or tied down, and only allowed to rise to its proper position at the time of reading. To allow for the weight of the float and rod, these gauges are generally so constructed as to show 0 only when a small amount of water is left in them. Care must always be taken to set the rod to the zero or 0.

VII.—CAN AND BOTTLE GAUGES.—The measuring glass should always be held upright, or placed on a level slab; the reading is to be taken midway between the two apparent surfaces of the water.

VIII.—TIME OF READING.—Nine a.m. daily; if taken only monthly, then 9 a.m. on the 1st.

IX.—DATE OF ENTRY.—The amount measured at 9 a.m. on any day is to be set against the previous one ; because the amount registered at 9 a.m. of, say, 17th contains the fall during 15 hours of the 16th, and only 9 hours of the 17th.

X.—MODE OF ENTRY.—If less than one-tenth ($\cdot 10$) has fallen, the cypher must *always* be prefixed ; thus, if the measure is full up to the seventh line, it must be entered as $\cdot 07$, that is, no inches, no tenths, and seven hundredths. There must always be two figures to the right of the decimal point. Even in the case of one-tenth of an inch (usually written $\cdot 1$) a cypher must be added, making it $\cdot 10$. Neglect of this rule causes much inconvenience. All columns should be cast *twice*—once up and once down, so as to avoid the same error being made twice. Never copy a total, always cast the column afresh. When there is no rain, a line should be drawn rather than cyphers inserted.

XI.—CAUTION.—The amount should always be written down before the water is thrown away.

XII.—SMALL QUANTITIES.—The unit of measurement being $\cdot 01$, observers whose gauges are sufficiently delicate to show less than that, are, if the amount is under $\cdot 005$, to throw it away, if it is $\cdot 005$ to $\cdot 010$ inclusive, they are to enter it as $\cdot 01$.

XIII.—ABSENCE.—Every observer should train some one as an assistant ; but where this is not possible, instructions should be given that the gauge be emptied at 9 a.m. on the 1st of the month, and the water bottled, labelled, and tightly corked, to await the observer's return.

XIV.—HEAVY RAINS.—When very heavy rains occur, it is desirable to measure immediately on their termination, and it will be found a safe plan after measuring to return the water to the gauge, so that the morning registration will not be interfered with. Of course if there is the slightest doubt as to the gauge holding all that falls, it must be emptied, the amount being written down, and added to the subsequent measurement.

XV.—SNOW.—In snow three methods may be adopted—it is well to try them all. (1) Melt what is caught in the funnel by adding to the snow a previously ascertained quantity of warm water, and then, deducting this quantity from the total measurement enter the residue as rain. (2) Select a place where the snow has not drifted, invert the funnel, and turning it round, lift and melt what is enclosed. (3) Measure with a rule the average depth of snow, and take one-

twelfth as the equivalent of water: This being a very rough method, is not to be adopted if it can be avoided. Some observers use in snowy weather a cylinder of the same diameter as the rain gauge, and of considerable depth. If the wind is rough, all the snow is blown out of a flat-funnelled rain gauge. Snowdon pattern gauges are much the best.

XVI.—OVERFLOW.—Not a year passes in which some gauges are not allowed to overflow, it is therefore necessary to call attention to the fact that there does not seem to be any part of the British Isles where 4 inches may not fall in 24 hours. It is not desirable to purchase any gauge of which the capacity is less than 6 inches.

XVII.—SECOND GAUGES.—It is desirable that observers should have two gauges, and that one of them should be capable of holding 8 inches of rain. One of the gauges should be registered daily, the other weekly or monthly as preferred, but always on the 1st of each month. By this means a thorough check is kept on accidental errors in the entries, which is not the case if *both* are read daily. Observers having two gauges and recording both daily, should keep the records distinct, and forward a copy of each. Never take a mean of two.

XVIII.—DEW AND FOG.—Small amounts of water are at times deposited in rain gauges by fog and dew; they should be added to the amount of rainfall, because (1) they “tend to water the earth and nourish the streams;” and not for that reason only, but (2) because in many cases the rain gauges can be visited only monthly, and it would then obviously be impossible to separate the yield of snow, rain, &c. therefore, for the sake of uniformity, all must be taken together, and as except by watching all night it is never possible to be certain that small amounts are wholly dew, it is best to count all entries of .01 in. or upwards as days with rain.

XIX.—DOUBTFUL ENTRIES.—Whenever there is the least doubt respecting the accuracy of any observation, the entry should be marked with a ?, and the reason stated for its being placed there.

XX.—BREAKAGE.—The Editor has no desire to supply rain gauges or glasses, or in any way to undertake, or interfere with, that which is the business of Opticians; but the continuity and permanent accuracy of the records of his correspondents is to him of such importance, that he deems it advisable to announce that any assistance in his power is always at their service.

XXI.—LEAKAGE.—Observers should test their gauges occasionally to see that the amount collected is neither increased nor decreased by leakage.

LIST OF PUBLICATIONS.

BRITISH RAINFALL,

Cloth 8vo. 10s.

This is the general summary and epitome of the year's work ; it contains a report upon the progress of rainfall investigations, and full records of the rainfall of each year. It is published annually, and all the volumes since 1864 can still be had.

SYMONS'S MONTHLY METEOROLOGICAL MAGAZINE,

8vo. 5s. per Annum.

This was established in 1866, to afford a medium for the prompt publication of rainfall statistics, besides which it discusses all branches of meteorology. It numbers among its contributors many of the ablest meteorologists, and circulates in all quarters of the world.

All the volumes except V. and VI. can still be had.

Blank Forms, Diagrams, &c.

Form for Entry of Daily Rainfall . . .	Fcp. folio.	3d.
Blank Meteorological Register, with Instructions :		
For one year (stiff paper cover) . . .	4to.	2s.
For five years (half bound roan) . . .	4to.	7s. 6d.
Diagrams for Barometer, &c., for one year . . .	4to.	1s.
Specimens of the above Forms and Diagrams . . .	various	6d.

Pocket Meteorological Tables.

Short and Simple Rules for accurately determining altitude barometrically, with sundry useful tables (4th edition)		
	cloth, 32mo.	2s. 6d.

All Books, Forms, &c., are sent Post Free.

62, CAMDEN SQUARE, N.W.

G. J. SYMONS.